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Gleanings in Bee Culture

VOL. XXXIX

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Editorial

OHIO bee-keepers are reminded of the State convention to be held in Cincinnati, at the Grand Hotel, Feb. 16 and 17. Fuller particulars given in editorial notice Jan. 15.

SHIPPING CARLOADS OF BEES TO A WARM CLIMATE TO PASS THE WINTER.

We take the following from the Los Angeles *Examiner*, which will explain itself:

THREE CARS OF BEES ARRIVE; UTAH HONEY-GATHERERS SHIPPED TO CALIFORNIA TO ESCAPE COLD WINTERS.

SAN BERNARDINO, Dec. 15.—Three carloads of honey-bees arrived in this city yesterday from Utah. They are the property of M. E. Miller, John Chantry, and George Hale, Utah bee-men, and they will winter in the vicinity of Colton and Highgrove. The bees are unable to survive the cold Utah winters. Next spring they will be taken north.

We shall be pleased to have a full report of the success of this experiment from either of the interested parties.

AN EFFORT IN MICHIGAN TO GET A NEW FOUL-BROOD LAW PASSED.

We received the following notice from E. D. Townsend, President of the Michigan Bee-keepers' Association, regarding the effort that will be made toward getting new foul-brood legislation in that State. We hope that no bee-keeper who lives in Michigan will put off writing these letters, for the expressions of the people have great influence, as every one knows, with the legislators. Let no one imagine that, because his bees have never had the disease, they never will have it. Foul brood is spreading at an alarming rate, and very stringent measures are necessary to stamp it out.

ATTENTION, MICHIGAN BEE-KEEPERS!

At Grand Rapids, last November, at our State meeting, a legislative committee was appointed to draft a new bill pertaining to bee-diseases in Michigan, and introduce it to the Legislature now in session. At this date, Jan. 9, the proposed law is nearly ready to introduce, it being along the line of the one proposed by Dr. E. F. Phillips, of the Apian Department at Washington. We are asking for considerably more money in the shape of an appropriation and the privilege to appoint several inspectors instead of one, as our present law provides. There are but two or three months in the year suitable for inspecting bees, and one inspector can do but little in this limited time. We should have ten men ready to start out next spring, and we will have them provided we can get this law passed.

Hon. Geo. E. Hilton, who represents the bee-keepers, will go to Lansing this month (January), and introduce the bill. Now, the object of this notice is to ask every Michigan bee-keeper to write both his Representative and Senator, now at Lansing, to

lend their support to the bill. If this is not done, we might as well do nothing, for Gov. Osborn has already sent a message to the Legislature advising economy in all branches, and it will be a hard pull, at best, to get this bill through.

Remember, brother bee-keepers of Michigan, we are depending upon you, and you alone, to get this measure through, for our task will be a hopeless one unless we all lend a helping hand and keep "digging" at our legislators until they simply have to vote for this bill to get rid of us. Let us all remember our duty.

Fraternally yours,
E. D. TOWNSEND.

APICULTURE AT SYRACUSE UNIVERSITY.

We understand that the Zoological Department of Syracuse University, under the direction of Prof. W. M. Smallwood, plans to give a short course in apiculture early in May. The University is now adding courses in agriculture, and the course above mentioned will be one of the first of the special courses open to students.

The plan for the first year includes about four lectures, to be given by some of the leading bee-keepers of the region. These lectures will be followed by demonstrations of the actual manipulations of bees, diseases of bees, etc. The University is fortunate in having, within a few miles radius, some of the best bee-keepers in the State, and we feel sure that these men will be delighted to assist in any way possible.

While a few of the State agricultural courses have had courses in bee-keeping, this is probably the first time that any other educational institution has given such a course. Bee-keepers have not been awake to the desirability of such courses, but there can be no doubt that, if well-trained zoologists have their attention called to the problems of bee-keeping, it will result in investigations of great interest and value to the practical bee-keeper. We are pleased to express our approval of this movement, and we congratulate especially the bee-keepers of New York State on this advance. We feel sure that the interest in the course will warrant its continuance.

BEE-KEEPING IN NEW ZEALAND.

BEE-KEEPERS of this country are apt to pay little attention to the industry as carried on in other parts of the world, especially in those countries that we do not hear so much about. Bee-keeping in New Zealand, however, is in a very healthy state, and an able apian department is conducted in the *New Zealand Farmer, Stock, and Station Journal*, which, by the way, is larger and better illustrated than any other farm paper that we have ever

seen. In the December issue, a large clear engraving shows the twenty-six members of the newly formed North Otago Bee-keepers' Association, of which John Allan is president. This association holds field days and regular conventions, and is as up-to-date as any association in this country. At a meeting held on Nov. 5, during a discussion on the question of foul brood, the McEvoy treatment was endorsed as one that gave the greatest benefit. After this followed a demonstration of fixing foundation in frames. The question of the disposal of the honey-drop was also taken up in detail.

MORE PROOF THAT FARMERS ARE NO LONGER "KILLING THE GOOSE THAT LAYS THE GOLDEN EGG."

ONE of our subscribers, J. R. Mintle, of Glenwood, Iowa, has sent us a clipping from the *Mills County Tribune*, on the subject of sweet clover. One of the local attorneys, who owns a ranch in Northern Nebraska, is reported as saying that his cattle are being fed from a stack of sweet clover, and that they not only like it, but are doing well on it. He plans on putting in ten acres of sweet clover in the spring. A near neighbor has a forty-acre patch.

One of the Professors from the State Agricultural College, at Ames, Iowa, in a recent address at Glenwood, stated that sweet clover would soon come into more general use, as farmers have ceased treating it as a nuisance, as they did formerly.

OUR DEPARTMENT EDITORS.

ON page 71 of this issue we present a picture of each of the department editors, some of whose faces may, perhaps, be unfamiliar to our readers.

Dr. Miller and G. M. Doolittle, whose departments appear each issue, need no introduction, for they have been considered sound authorities in bee culture for scores of years, we might say—at least for considerably more than twenty years. And for years to come the writings of these two will live on, extending and perpetuating their good records. Whenever we think of these two old friends we understand a little more clearly why it is that some men never die.

Wesley Foster, Mrs. Acklin, and J. L. Byer, whose departments appear in the first issue of each month, are the newer members of our staff. Mr. Foster has appeared before our readers long enough to show that he has made good. Mrs. Acklin, whose department, "Bee-keeping in Southern California," started last summer, has also proved that she is alive to the bee-keeping interests in her territory. Mr. Byer, who takes Mr. Holtermann's place in furnishing "Notes from Canada," as mentioned in our Dec. 15th issue, appears for the first time as head of the Canadian department in this issue. We have known him for some time as an occasional contributor, and we are sure that his comments will be no less valuable, coming, as they will, from now on, every month.

Louis H. Scholl and J. E. Crane, whose departments appear the second issue of each month, have also been with us long enough so that our readers know them to be safe counselors. Mr. Scholl stands rather high in the world, being nearly six and one-half feet tall; but Mr. Crane, though not so large has shown himself to be a good "sifter."

EUROPEAN FOUL BROOD; MORE PROOF OF ITS EUROPEAN ORIGIN, AND HENCE THE FITNESS OF THE NAME.

EVIDENCE is beginning to accumulate, showing that European foul brood, or what we formerly called "black brood," is more or less common in England and on the Continent. Indeed, there is a possibility that it is the common brood disease in Great Britain. After carefully analyzing the writings of some of our European authorities, particularly of our British cousins, we are convinced that, when they speak of a "mild type" of foul brood, most of the larvæ dying before they are sealed, they are unwittingly describing European foul brood; that when they give the symptoms of the more advanced stages, after the brood dies when sealed up, they are describing the genuine foul brood, or what we call American foul brood. Let us take, for example, two or three references. Turning to Dzierzon's "Rational Bee-keeping," English edition for 1882, page 273, we find the following:

FOUL BROOD IS OF TWO KINDS.

There is one kind that is mild and curable, and another kind malignant and incurable. Both kinds are, however, contagious.

The curable occurs in this way: More of the larvæ die still unsealed, while they are still curled up at the bottom of the cell, rotting and drying up to a gray crust that may be removed with tolerable ease. The brood which does not die before sealing mostly attains to perfection; and it is only exceptionally that foul-brood cells are met with sealed.

This is exactly reversed in the malignant kind of foul brood. In this the larvæ do not generally die before they have raised themselves from the bottom of the cell, have been sealed, and begun to change into nymphs. The rotten matter is, therefore, not found on the cell floor, but on the lower cell wall. It is brownish and tough, and dries up to a firm black crust, both in consequence of the heat prevailing in the hive, and of a small opening bitten in the depressed cover. This matter the bees are not able to remove; and when they are in some strength they can at most get rid of it by entirely biting down the tainted cells and making fresh ones.

It is a marked characteristic of European foul brood that most of the larvæ die *before* they are sealed. In other respects the second paragraph exactly describes the disease. The last paragraph undoubtedly refers to American foul brood.

Again, we turn to Samuel Simmins' book entitled "A Modern Bee-farm," edition 1904, page 103. In speaking of the cure for foul brood he says:

Cheshire considered that the queen should not be removed; but, on the contrary, if it is intended to save the combs I have found the first step toward a rapid recovery is made by deposing the reigning queen and giving a young and vigorous queen bred from clean stock, when the entire attitude of the bees is changed, and great determination and energy take the place of the former utter inability to clear out the foul stuff.

If the disease begins in the early spring and is not noticed, it is very likely the colony will go down at a rapid rate, while the remnant will not be worth troubling with, and should be cleared out by fire after sulphuring the bees. This should be done in the evening when all the other stocks are quiet, taking care to foul as few things as possible. Burn all you use that are not of much value, and the rest disinfect thoroughly.

European foul brood shows up strongest in the spring or early summer. Observe, also, that Simmins refers to the possibility of curing by changing the queen and substituting a vigorous queen (a part of the Alexander treatment for European foul brood). He also mentions the ability of the bees to clear out the "foul stuff." We have our doubts whether colonies, unless very powerful, will clean ordinary American foul brood out of the combs; but there is no doubt now but that they can and do remove the grubs dead of European foul brood.

Again, we turn to a card sent out by the British Bee-keepers' Association, showing a photograph of what looks like the old-fashioned American foul brood in an advanced stage. On the reversed side of the card we find the following:

1. *How to recognize Foul Brood in its earliest Stage.*—Healthy brood is recognized by being compact, and the larvae of a pearly whiteness. When young they are curled up at the bases of the cells in the form of a C. If any of the larvae are attacked by the disease, instead of being curled up and plump they are extended horizontally in the cells, are flabby in appearance, and are of a pale yellow color, changing to brown, and begin to decompose. They then dry up, leaving only a dry brown scale on the side of the cell. (For "chilled" brood the dead larvae turn gray and not brown.)

2. *Later Stage.*—When the larvae die after the cells are capped over, here and there cells will be found with cappings slightly indented, and darker than those of healthy brood. The cappings are also frequently perforated with irregular holes.

3. *Advanced Stage.*—This is well illustrated in the photograph of a comb badly affected. It will be seen that the capped cells are in irregular patches, indented, and most of them perforated. If the capping of a cell is removed, and a piece of stick introduced, a putrid, ropy, sticky, coffee-colored mass will be found—all that remains of the larva—often emitting a most disagreeable stench.

The disease is extremely contagious, and prompt measures should be taken to prevent its spreading by medicating the food with naphthol beta and by using naphthaline as a preventive.

The first paragraph, referring to "early stages," is an exact description, so far as it goes, of European foul brood. The next two paragraphs, referring to "later" and "advanced stages," clearly describe American foul brood.

In Cowan's "Hive and the Honey-bee" we find practically the same description, and very possibly the foul-brood card of the British Bee-keepers' Association was written by Mr. Cowan himself.

Still again, we find quite a conflict of opinion among several of these European writers. Some of them, including Cowan, Cheshire, and Simmins, recommend drugs of various sorts; others appear to believe that they have no value. In this country, at least, practically all of our authorities have agreed that any form of medicine or spray applied to the combs of American foul brood is a waste of time and material; but, so far as we know, these same authorities, in this country, have never tried germ-

icides of any sort on the European type of the disease, and there is a possibility that they may have some value. The fact that some of our friends across the water persistently recommend them for the disease they have is significant.

And, again, let us turn to the testimony of the bacteriologists. Chene and Cheshire (English) discovered a microbe that was apparently always present in the foul brood that they examined, and Cheshire later called it *Bacillus alvei*. Dr. G. F. White, of our Bureau of Entomology, Washington, D. C., always finds this microbe in the European type of disease, but rarely in the American, if we are correct. Burri and Maassen, eminent European bacteriologists, have described a disease which is certainly our European foul brood, and no less an authority than Erne recognizes our claims with reference to the cause of American foul brood; namely, that it is *Bacillus larvae* (White), and not *Bacillus alvei*. Malden, another eminent British bacteriologist, whose paper we recently reviewed in these columns, page 542 of the Sept. 1st issue of last year, confirms the work of our own Dr. White, and, apparently accepting our terms for the two types of disease, uses the names European and American.

A recent article by Mr. Samuel Simmins, author of "A Modern Bee-farm," above mentioned, who appears to have in mind American foul brood, seems to be really describing the European type of the disease. He tells of the value of requeening with vigorous Italian or Carniolan stock, and says that it is not necessary to destroy the combs. He also refers to the value of certain drugs, particularly "izal," as one that will effect a complete and permanent cure.

Taking all the evidence together, we are forced to the conclusion that at least some of our European authorities, especially in view of their conflict of testimony, have been describing two different diseases; that when they refer to the ability of the bees to clean out the combs, removing the dead grubs, they unwittingly refer to European foul brood. In various references we find they make mention of what they call chilled brood. While we have chilled brood in this country, from certain described symptoms it appears that our British cousins are talking about European foul brood.

Possibly our friends across the water may take issue with us; but the exact work of *their own* bacteriologists is very significant as pointing to two types of disease—significant, further, because these same scientists seem to confirm Dr. White's work in many very important respects.

It remains to be seen yet whether *Bacillus alvei* is really the microbe responsible for European foul brood; but the fact that European scientists have found it so often in their specimens of affected brood indicates that they must have and have had a great deal of what we have named (and correctly so (as we view it) European foul brood.

Stray Straws

By DR. C. C. MILLER, Marengo, Ill.

F. DUNDAS TODD, page 22, speaks of a follower in ten-frame hives. Have manufacturers really made that desirable addition?

OLIVER FOSTER's first bees were bumblebees, p. 6. So were mine; only, instead of being on a window-sill, mine were in a hay-mow.

THE HONEY-EXTRACTOR was invented in 1865 by an Austrian, Major Franz Edler von Hruschka, who was born at Vienna in 1819, and died at Venice, Italy, 1888.

"WHAT KIND of a mile?" I am asked, p. 32, is meant, where the bees were four or five minutes getting over $\frac{1}{4}$ mile. It was given in meters, and I translated it into U. S. miles.

A. SNYDER, when he wants to talk honey to a grocer, sets on the counter an observatory hive, six by eight inches in size. That secures the attention of the grocer at once. —*Review*, 310.

J. L. BYER said at the National convention that it is necessary to have a large stock of extracting-combs in order to get a good crop of honey, and just as necessary in order to get a crop of *good* honey.

A VERY OLD brood-comb weighed $36\frac{1}{2}$ oz.; a new one that had not been bred in weighed 11 oz. That means that there might be a difference of about 16 pounds in the weight of two ten-frame hives, each containing the same amount of bees and stores. Some colonies have probably starved because heavy old combs fooled the bee-keeper into thinking they had stores enough.

C. B. PALMER, you say, page 38, that I didn't know where to put baits when no excluder is used. Well, I do now—put 'em just the same as with an excluder. You are mistaken in concluding that I used an excluder. Never. There may be no law in Nebraska against your way of doing, but I wouldn't do some things you do. I wouldn't use a bait *partly* filled with comb, and I wouldn't have a drop of honey in it. I wouldn't use a bait in any super after the first; I'd use them all in the first. Generally I have only baits enough to put a single one in the first super, and I put that in the center. With my way I never knew a queen to lay an egg in a bait.

R. V. COX, you advise, p. 52, to read Alexander's treatment for European foul brood, and "follow it to the letter." But do you follow it to the letter? You say "queenless 26 days," and then "a first-class Italian queen." He says, 1905, p. 1125, queenless 20 days, and then "a ripe queen-cell or a virgin just hatched." He says the old queen may be given after 27 (not 26) days, but advises against it. Mr. Alexander de-

serves great credit as a pioneer blazing a way through a pathless forest; but if any one finds a way only half as long, do you think it is disloyalty to Mr. Alexander to follow the shorter way?

MR. EDITOR, you say, p. 52, for cell-building, to feed queenless bees syrup daily. Will feeding make any difference when a heavy flow is on? [Of course, it is not necessary to feed up when a heavy honey-flow is on. One of our queen-breeders says he much prefers not to have a heavy flow. He can secure better results when the bees are fed moderately or when the yield of honey from natural sources is only moderate. A flood of honey upsets cell-building to a great extent.—*Ed.*]

"IF THE COMBS become so thick and the cells so small as to leave too little room for young bees they had better be melted up," p. 52. That scares me. It will be 50 years next summer since I began keeping bees, and I never yet melted a comb because old. Do you suppose my cells are too small? How shall I tell? Would you advise me to melt up all my old combs? [You are putting up a hard question; and yet if you will take our statement literally it will not necessarily imply that you will have to melt up your combs. Authorities do not quite agree; but the majority seem to think that when the cells become too small, by reason of accumulations of cocoons, the bees remove the surplusage until the cells are large enough to admit of the rearing of brood. Assuming that to be true (and we believe it is), you would not have to melt up your comb. In the quotation, page 52, we are not assuming that it would be true, but only making the statement that, *if* the size of the cells is reduced by many years of brood-rearing, combs with such cells should be melted up.

We may say we believe it would be a good practice to melt up all old combs since brood diseases have become so prevalent all over the United States. Experience shows that disease lurks for years in old combs, and then when conditions are favorable it will break out. Let us suppose a case where a comb contained the spores of American foul brood; that those spores were covered with several layers of cocoons; that the bees remove several layers of cocoons in a certain season, exposing the spores covered up for years. What happens? An outbreak of the bee disease. That this is not an idle theory was proven at one of our outyards, where we had American foul brood some 15 years before. All of a sudden foul brood began to break out in that yard. An examination showed that it appeared only in those hives that had some of those original combs. We then began melting up every one of those combs whether disease showed up or not, and presto! foul brood stopped coming back. We know that diseases that infect the human family may lie in old garments for decades; then why not in "old garments" occupied by baby bees?—*Ed.*]

Bee-keeping in Southern California

BY MRS. H. G. ACKLIN, GLENDORA, CAL.

The State Association convention has been postponed till this month. Too many other irons in the fire the latter part of last December.

According to tradition, black sage must needs have an off year occasionally; and as last season was an "off" with a vengeance, may be this year will be a good one if Jupiter Pluvius regards us favorably.

It seems that my own town, too, is getting its "fill" of apiaries. A friend in the real-estate business told me recently that two men had been looking through the foot-hills for a bee location, and went home without finding a suitable place.

During the holiday vacation the four colonies of bees back of our friends' house at the beach were as busy as Minnesota bees are in summer time. They kept right on attending strictly to business, paying no attention to me whatever as I went prowling around their hives.

While at one of the beaches around holiday time a man came to our friends' house saying he had caught a swarm of bees and wanted a "gum" to put them in, as they were then in a nail-keg. A runaway swarm of bees just before Christmas! What do you know about that?

Does it pay to sow seeds of honey-producing plants in our canyons? I infer that it does from meeting a bee-keeper who had a snug little sack full of such seed for a bee-keeping friend. I inquired the names of the plants from which the seeds were gathered, but he did not know, saying there were two or three kinds in that one sack.

I note, p. 718, that Mr. Gibson is in favor of leaving the latch-string out for tidy bee-keepers. But how shall we know till the whole transaction is done whether the new comer will flavor his honey with dead bees or not? But to me a mature bee in honey is not as repulsive as larvæ. Of all the apiaries I visited last season, only one was in working order; consequently my knowledge as to the neatness of our bee-keepers is limited.

One could never imagine the great number of bees kept in this country by taking a trip on the steam-cars. They are clustered behind hills and up canyons till I never expect to see an apiary from a railroad train

any more. So it was on a recent trip to Redlands. We saw only one little cluster of hives, and I felt sorry for the poor bees left there on those stones.

Mr. B. G. Burdick, President of the State Association, met us at the station, and took us directly to his home, where we had a cordial welcome and a warm supper. The next day I changed my mind as to the number of bees in the vicinity of Redlands, as Mr. Burdick took us sailing around over hills, through valleys, and up canyons. That bee-keepers are gradually being driven further and further back into the mountains was evident everywhere. Eight-horse teams pulling heavy disc plows were following each other around steep hillsides, preparing the same ground for a crop that formerly was covered with button or black sage. Mr. Burdick's apiary of 250 colonies is located in Live Oak Canyon, a pretty spot; but the ground is cultivated on one side nearly up to the hives. He is planning to move the bees further up the canyon.

One novel feature about the place is a honey-house built from parts of old Harbison hives, and it is a pretty fair honey-house too. One thing I liked about it was the way in which extracting-supers are managed. Two doors in the back lift up, and are just near enough the ground so supers from a wheelbarrow can be shoved in easily. Inside there are smooth strips nailed to the floor for the supers to slide on. Empties are pushed out the other door in the same way, and loaded on the wheelbarrow, without much lifting. One advantage in this way of manipulating supers is that the front door of the honey-house is shut most of the time, keeping out the throng of bees which sometimes follow the supers.

If I remember correctly, this yard is six or seven miles from Redlands, and not near orange-groves, although the principal crop, which was good for this year, was orange honey. The principal forage around here is orange and sage; but there are many minor honey-producing plants and shrubs on the foothills and mountains.

Every town has its "bee-man," and Mr. Burdick seems to enjoy that peculiar distinction in this little city of beautiful homes. Frequently he is called upon to remove swarms of bees from some of those handsome houses, and has to be very careful to leave the buildings in as good condition as he found them, which must be a difficult task, considering the almost impossible nooks and corners into which the bees go. Whoever has the good fortune to visit Redlands must, of necessity, see the parks and other beauty spots. From Smiley Heights the view is magnificent. Looking across San Timoteo Canyon some large apiaries can be seen. R. H. Burdick, son of B. G. Burdick, has an apiary of 250 colonies in this canyon. Mr. and Mrs. E. D. Bullock, who have an apiary of 250 colonies in Moreno Valley, twelve miles from Redlands, called at the Burdick home in the evening.

Bee-keeping Among The Rockies

By WESLEY FOSTER, Boulder, Colo.

I certainly should like to have a winter nest constructed as the illustrations Editor Root shows in the January 1st issue. There are plenty of empty cells in our combs, but there is a lack of sealed stores arranged in proper relation to the brood or clustering nest.



Referring to what I have said regarding retail packages for extracted honey, I will add that the Mason jar is the most economical jar for honey, for the reason that it can be used the second time. But it is not a suitable jar for shipping, and *the cap will not hold the honey* so it will not leak. A plain jar with a tight cap about the size of the pint Mason jar is about the best size for honey. Since taking the picture shown on page 17, and writing the article, I have seen honey put up in the tall thin bottles that olive oil is so often sold in. These packages hold six or eight ounces, and were marked at 25 cts. On inquiry I found that many customers thought they held as much honey as a pound comb of honey. The consumer was paying from fifty to sixty cents a pound for an average grade of extracted honey! The glass bottle would cost as much as or more than the honey it contained when bought of the producer.



I have a two-frame nucleus, which, however, is but little smaller than the average colony this winter, that I am wintering in an observatory hive placed in our dining-room window. They have an exit through the sash and are shielded from the light except when some one wishes to look at them. They are a source of interest to the children, and I am curious to know how they will come through the winter. Their stores are mainly sugar syrup fed to them in October, half sugar and half water by weight. I notice a few hard granules on the bottom of the hive that they can not manage. There is about a quart of bees, and from Nov. 19th to Christmas day those bees ate just 16 ounces of their stores. That is a trifle less than a half-ounce per day. So far but very few dead bees have been carried out, not over fifteen or twenty, for their exit opens out upon our porch, and if any dead bees are dragged out they are easily seen. A half-dozen dead bees is all that I have seen so far. They do not seem to be anxious about flying when the weather is rough outside, even though their hive is in a room that has a temperature of from 65 to 70 degrees Fahrenheit.



WHY COMB HONEY IS USED MORE THAN EXTRACTED IN COLORADO.

Taking the markets of Colorado as a whole, I believe that four pounds of comb honey is eaten to one of extracted. There are two main reasons for this, the first being

that comb honey looks so much more attractive on the table, and is more of a delicacy, while the extracted honey seems more of a syrup. The second reason is that people fear adulteration; in fact, there are many who hold this opinion against almost any thing that one can say. Here is where we must get in our house-to-house work, and educate the people to the fact that there need be little fear nowadays of adulteration of bottled honey. We can do this by telling the housewife the methods and appliances used in raising extracted honey. So many think that, because extracted honey is so reasonable in price, this is proof that it is adulterated. A well-known writer unmuzzled his ignorance by voicing this idea not long ago in one of the large monthly magazines. How prone we are to ascribe wrong motives to the other fellow when the fault lies in our own ignorance!



THE CAUSE OF THE HIGH WINDS IN COLORADO.

The gray, level, buffalo-grass-covered plains slope away to the east of the Rocky Mountains for five hundred miles. The altitude of this great plains region ranges from five to six thousand feet at the foot of the mountains down to two or three thousand feet, five hundred miles east of the Rockies. The whole area is semi-arid, and the irrigated portions take in but little more than the river valleys, which, when drawn on a map in their comparative size, look like small fine tracings or narrow ribbons drawn across this great wide region. This gray expanse draws the warmth of the sun's rays on our bright days, which succeed each other almost indefinitely during the fall and winter. Now, as this plains region becomes warm, the warm air rises, and the cooler air from the mountains rushes down from the snow-capped ranges and foot-hills and across these plains at a terrific speed. If it were not for the rarity of the air much damage would be done; but this light air does not exert the pressure that heavier-weighted air does. However, many windows are blown out of houses, roofs lifted, and, of more concern to the bee-keeper, the covers blow off the hives, the hives tip over, and piles of supers left out are scattered in every direction. A single brick is not sufficient to hold an average cover on unless the bees have it firmly sealed. Colonies of bees that are light in weight are often blown over.

Now, this wind has some advantages, for it does not begin till there has been a snowstorm on the range for one or more days. While this snowstorm has been going on in the mountains the plains have been warming up from the many days of bright sunshine. This brings about the rush of cold mountain air from the snowy peaks out to the plains. This wind will blow from one day to two weeks, and will drift the snow into the ravines and gulches in the mountains, saving it in the deep drifts till it is needed late in the next summer for irrigation.

Notes from Canada

By J. L. BYER, Mt. Joy, Ont.

Those moving pictures showing Mr. Metcalfe's assistant at work are good; but it seems to me, by the bend in the operator's back, that the hives are too low down for comfort. This is a fault in too many yards, including some of my own, and in the future I want to have the hives higher than they have been in the past. A man can work all day at a job if he can be upright most of the time, without getting fatigued; whereas if he has to be stooped over most of the time, half the amount of work will tire him.



Somewhere in our house, search would reveal one or more pairs of trousers with the legs scorched on the inside below the knees. It is not necessary to say that said scorplings, and burnt holes sometimes too, have been the subject of inquiry on the part of a certain woman in the household. Imagine with what elated feeling the writer read to this woman the words of Mr. Metcalfe, page 791, Dec. 1, where he says that, if a man came to him asking for a job to take off honey, and he noticed that his overalls were smoked and scorched between the knees, he would say "yes" without asking him a single question. It might not be out of the way to add that one time, at least, the damage was more than smoke or scorching, and that a fair-sized *flame* was in evidence before the fire was extinguished.



That picture showing the interior of Hans Matthes' house, page 15, Jan. 1st, certainly gives one a cosy feeling. The open fireplace and comfortable old-fashioned chairs around the table remind one of many homes in this locality some years ago, as this section was originally settled with Dutch who came here from Pennsylvania. As I showed an aunt of mine the picture, she at once remarked, "Those chairs are just like those grandfather used to make;" and I might add that at all sales where a few of these articles of furniture are now offered they bring good prices from people who make a fad of saving up old-fashioned things as relics. We have but one of these chairs in our home; and I confess that, although not a relic-hunter, yet it would take quite a price to buy that chair, as every time my eye rests on it I am reminded of the dear departed grandfather who made it years ago. This same grandfather, by the way, was a very successful bee-keeper when bee-keeping was hardly looked upon as a specialty as it is now; so it will be seen that, whatever bee-keeping blood the writer may have in his veins, it has been inherited.



The Dominion Railway Commission which has had the express companies of Canada on trial, as it were, have handed in their judg-

ment, which is sweeping in its denunciation of the accused. The tariffs are declared to be altogether too high, and many of the provisions attached to the printed contracts to be unfair to the shippers. The companies are given three months to revise and formulate new rates and contracts, and to hand the same to the Commission for their inspection at the expiration of that date. The officials of the companies met in Montreal; and, although some of them were inclined to kick at the verdict, yet they wisely concluded to accept the ruling in view of the fact that they could not well do otherwise. We notice that the chairman of the Dominion Commission, J. P. Mabee, and Martin A. Knapp, Chairman of the Interstate Commerce Commission of the U. S. A., have come to an agreement regarding the control of railways crossing the boundary, and this is certainly a good omen toward the successful formation of an international commission in the near future that would have the same power over *all* the express companies, as the Dominion Commission now has over the Canadian companies. This is of interest to the bee-keepers; for if any class of producers have to pay the price with a vengeance, we certainly do. The powers of the Dominion Board are supreme, and it is only by the show of the "big stick" that heartless corporations can ever be brought to time.



In stepping into the breach caused by the retirement of friend Holtermann from this department, it is with a feeling that perhaps we are "biting off more than we will be able to chew," and certainly if left entirely to our own devices such an outcome is but a logical conclusion. However, we feel that many bee-keepers on this side of the line will give us their active support; and to such we would say that at all times it will be a source of pleasure to us to have items of news sent in; and if any one has practical suggestions to offer as to how this page can be made of more interest to the apiarists of Canada in particular, these will be thankfully received and given due consideration. At the same time, be it understood, the editor has given me a free rein, and liberty to meddle in the affairs of the people in other parts of the country—in fact, has even given me the privilege of differing with *him* on any matter whenever so prompted—a privilege pretty sure to be taken advantage of quite freely, and we warn the aforesaid editor to keep his "blue pencil" well sharpened. Mr. Holtermann was often able to give extracts from the different German bee journals; and I am sorry to say that, from now on, as long as we are in charge of the department, extracts of that nature will be conspicuous by their absence. While the writer has quite a percentage of German blood in his veins, yet he is not familiar enough with the language to speak it, let alone make intelligent interpretations of printed matter. Perhaps some of our German friends will come to our aid.

Conversations with Doolittle

At Borodino

TIME OF DAY SWARMS ISSUE, ETC.

Would you tell us about what time in the day the prime swarm and after-swarms issue? My neighbors and I do not seem to agree. I claim that prime swarms issue only between the hours of nine in the morning and three in the afternoon; while one of my neighbors claims he has had prime swarms out as early as six in the morning and as late as five in the afternoon, and some of the others are inclined to share this opinion.

Prime swarms usually issue between nine in the morning and one in the afternoon, if the weather is fair, right along day after day; but if there comes a rainy time, with clouds and cool winds, swarming is delayed, and then prime swarms are almost as erratic as after-swarms. Several times during the past forty years I have known swarms to be kept back by bad weather, when the colonies were rich in stores, till the young queens began to "quahk" in their cells. When young queens are thus mature, and the swarming fever has not been satisfied, I have known of one or two prime swarms coming out as early as a quarter of five in the morning. This was a nice, clear, warm morning, following a full week of weather when the bees were shut in by bad storms.

Again, under similar circumstances, I had two swarms come between five and six o'clock in the afternoon, when it cleared off so the sun shone out warm and bright, for the first, at about 5 P.M. But under such circumstances there seems to be a division among the bees, a part of them taking sides with the young quahking queens, and the others with their old mother, so that, when such prime swarms issue, under the conditions given above, there are fewer bees with the swarm, and more with the ripe queen-cells. If the weather continues fine, I have known what is called a "second swarm" to issue two days later, with one or more of these young queens, and a beginner having no experience along this line, when such a state of affairs exists, rushes into print declaring that second-swarms often come two days after the first one.

Then cases are not infrequent when a colony, nearly or quite strong enough to swarm, loses the old mother-queen just before the swarming season, on which loss the bees start a lot of queen-cells to replace her. On the maturing of these cells, the flow of nectar becoming abundant, the bees are almost sure to swarm with these young queens; and in this case the first swarms do not hold to usual hours any more than do after-swarms, but come out at "any old time." If my memory serves me rightly, I once wrote about such first swarms with a young queen, calling them "prime swarms," when Dr. Miller straightened me out in great shape by telling the public that only swarms having the old or mother queen with them could be properly called *prime* swarms. And

Dr. Miller was right in the matter. As I now understand it, a prime swarm must always be a *first* swarm; but a first swarm is not always a prime swarm.

And this leads me to say that an after-swarm always has one or more young virgin queens; but *all* swarms issuing with one or more virgin queens are not *after-swarms*. Regarding the time of day when after-swarms issue, as hinted above, there is little dependence to be placed upon them, for they come at any time between five in the morning and seven at night. However, if the weather permits continued nectar secretion, with a clear sky, the majority of such swarms will come between 8 A.M. and 4 P.M., while fully half may be expected between 9 A.M. and 1 P.M.

WAX FROM OLD COMBS.

This same correspondent wants me to tell how to render very old combs that are partly filled with pollen into wax. For such combs I know of no better way than the water plan. I prefer to put such combs in a sack made of burlap, tramping the sack as the combs are put in so as to break the cocoons as much as possible; for with very old combs these cocoons, spun one after the other, as the multitudinous generations of brood are perfected, become so thick and hardened that, without some care, they hold most of the wax in the septum of the comb from coming out, even with water rendering. An old kettle is the best thing I know of for the desired purpose. Set it on three stones so you can build a fire under it and fill it two-thirds full of water. Now build a fire; and when the water boils, carefully lower the tied-up sack filled with the old tramped-in combs into the water. Allow it to rest for a few minutes till the water penetrates all through it, then with an old hoe press and roll the sack over for about five minutes, when it will appear nearly empty.

If you have more comb, bring out the mouth of the sack, untie and fill again, going through the same working and squeezing with the hoe as before, and so on till the sack becomes two-thirds full of refuse or you have all your comb in.

Now provide a piece of plank rounded somewhat to fit the bottom of the kettle. Nail another piece to it with the grain of the wood running in the opposite direction, so it will not split. Then nail through both to the end of a piece of scantling about one-third longer than the kettle is deep. Put the rounded-plank end on the sack, thus pressing it to the bottom of the kettle; and after hanging a heavy weight on the upper end of the scantling, and propping it in an upright position, allow the fire to go out. The next morning you will find the wax all nicely caked on top of the water in the kettle.

[This plan of rendering will work all right on a small amount of comb, so that lots of time can be given one batch; but if there is quite an accumulation of comb to render, a good strong press will be found to yield a greater quantity of wax in a much shorter time.—ED.]

General Correspondence

THE WINTERING PROBLEM IN ONTARIO, CANADA.

A Good Depth of Sealed Honey above the Cluster a Necessity; the Winter Nest Not as Important as Plenty of Honey in the Upper Part of the Combs.

BY J. L. BYER.

Notwithstanding the fact that many writers have claimed that the wintering problem has ceased to be a *problem*, yet every once in a while (perhaps our own experience) we hear of heavy losses both in outdoor and cellar methods, proving conclusively that the matter of wintering of bees in the northern sections of the country is still an important subject. That there are still widely different opinions on this very important phase of bee-keeping was brought forcibly to the mind of the writer as he read with much interest that article by the editor, p. 19, Jan. 1, entitled, "The Winter Nest of a Colony."

Now, while I do not profess to be an authority by any means on the matter of wintering bees, yet some hard knocks in the way of winter losses when they could be ill afforded have taught me a few essentials of successful wintering outdoors in "our locality," and it may seem a bit strange on my part to have to confess that, when I saw that engraving entitled "An Ideal Comb to Form a Winter Nest," I involuntarily remarked to myself, "Why, that is the very picture I would desire if I wanted an illustration to show what constitutes a *death-trap* in the way of outdoor wintering in a country with cold winters like ours."

Before going any further I wish to say most emphatically that, if we found a colony of bees in a Langstroth hive with the center combs like the one illustrated, having a depth of only about two inches of honey under the top-bars in the middle, we would put on a feeder about the first of October, or earlier, and give the colony at least 15 lbs. of syrup made on a two-to-one basis. Then we would feel that the colony was in an ideal condition for *wintering*, and quite likely the matter of an "ideal winter nest" would never be given a thought.

Please let it be understood that what I have said and may say further is for conditions as we have them here in Central Ontario, about fifteen miles north of Lake Ontario, where the bees frequently go for four months, and sometimes five, without a flight, the thermometer dropping for a day or two at a time to 20 below zero. However, I can not see how a warmer climate would make any difference in this matter; and, indeed, from the nature of the arguments of the editor the very opposite should be the case.

I have already called that comb a "death-

trap," so now it is either my duty to retract or prove that I have reasons for using such an expressive term when in an argument with so well posted and able a debater.

In the first place, I wish to make it understood that I have not the slightest doubt but that thousands of colonies are wintered each year on combs much in the same condition as the one illustrated, simply because that is the natural condition the combs will be in, provided there has been no late fall flow of honey nor artificial feeding. On the other hand, that same condition of combs here in Ontario is responsible for at least 50 per cent of the winter losses, with the possible exception of winters when honey-dew or other poor stores are present in the hives. Last winter was mild, and the bees had an opportunity to have quite an early flight in the spring; consequently, losses from any causes were almost *nil* so long as there was enough honey in *any* place in the hives to keep the bees from starving. Other winters in the past have told a different story, and from all indications the present winter is going to be an "old-fashioned" one, and I look for heavy losses wherever the bees were not well prepared in the fall, and allowed more than two or three inches of honey below the top-bars in the center combs of the hives.

The statement is made that colonies often starve right in the brood-nest when honey is only a few inches from the cluster. That is quite true. I have seen dozens of cases where the honey was all gone *over* the cluster, and the bees dead while there was honey at the far *ends* of the combs; yet I have never once seen a colony dead with honey *above* the cluster. I have very serious doubts that a strong colony of bees ever perished in such a condition, as the very nature of the problem suggests to my mind that it would be an almost impossible occurrence.

This past fall and winter up to the present (Jan. 7) has been very cold, and the bees have not had a real good flight since the latter part of October. Assuming that colonies have gone into winter quarters with the center combs having but two or three inches of honey beneath the top-bars, what will happen toward spring or even in February in some colonies if the present cold weather continues? The honey will be consumed from both sides and above the clusters, but much faster from *above* than from the sides, for the colder the weather the more rapid the consumption of stores above the cluster. By the time mentioned, many colonies will be right at the top of the combs with all the honey above them consumed, so that they will have to depend on drawing from the sides for future maintenance. With a real cold snap comes the contracting of the cluster *away* from the honey, and then the colony starves. Very often the bees thus stranded gorge themselves on pollen; and even if some of them survive starvation till the weather moderates, dysentery later on claims them as victims. This is a

very common condition here in Ontario, and I have not the slightest doubt that nearly all bee-keepers here in this Province who winter outdoors, or who have visited apiaries wintered outside, will bear me out when I say that I have not misstated conditions in any way. The remedy is obvious. See that the combs in the center are filled with good stores at least half way down; pack the bees away comfortably, and don't worry about the clustering-space for the bees.

In view of my experience, and what I have noticed with others, I can not put the stress on the "cold slabs of honey" idea that some do; and while the theory advanced seems reasonable, yet results are more convincing, and I think we are prone to forget that a very *small* clustering-space is necessary in real cold weather. Indeed, the writer of the article we are commenting on says that the cluster of a strong colony will be reduced down to a space about equal to that of the doubled-up fist. Personally we incline to the view that no strong colony gets into a space *that* small; but the smaller the cluster, the stronger the argument that only a small clustering-space is necessary. That bees do not at will come up among sealed combs in moderately cold weather is a mistaken idea—at least, my bees do not refuse thus to accommodate themselves. A few days ago, when the thermometer was below zero I carefully lifted the corner of different sacks of packing on top of the hives, and, turning up the quilts, looked down between the frames. The frames in these hives have top-bars but $\frac{7}{8}$ -inch wide, so a good view could be obtained. All the colonies thus examined showed bees in from six to eight spaces, and the clusters in the most of them were about half way or more up the combs—said combs being 12 inches deep. Above the bees the sealed stores showed in evidence plainly; but in so far as I could see with such a slight examination, the bees were for the most part below the honey. To-day the weather is milder (20 above zero), and a visit to those same colonies shows that the bees are clustered right under the cushions at the top of the combs, so at least four or five inches of sealed honey are covered by the bees with the weather as it is.

This past fall, while talking with H. G. Sibbald, one of our most successful winterers, he told me the amount of feeding he had done to his 450 colonies in preparing them for winter; and while I do not feel at liberty to state the quantity, yet all can rest assured that it is not likely there is a comb in the whole outfit that is empty of stores half way up to the top-bars. I do not think he is worrying about the matter of clustering-space, and it will be a big surprise to me if he loses a single colony from any cause in the line of stores. Then what about friend McEvoy? He limits the number of combs for the bees, and has every comb *solid* in September, so whatever clustering-space in the way of empty comb the

bees have is made after that date. His record in wintering is too well known to need any comment.

This article is too long already, and I will close by repeating that all a set of combs like the one illustrated needs to make them an ideal winter nest is the addition of 15 or 20 lbs. of sugar syrup about Oct. 1st.

Mt. Joy, Ont., Can.

[There are two conditions that might cause our correspondent and ourselves to come to different conclusions. The first is, that it is somewhat colder in Canada than in the locality to which we referred; second, we judge by what he says that he has absorbing cushions on his colonies, and not the sealed cover, which we use. At all events, we have every reason to believe that, under *like environments*, if the two of us could look over the same set of bees we would come to exactly the same conclusions; and, even under different conditions, we see evidence in Mr. Byer's article that goes to show that bees prefer the winter nest *if* they can have it. For example, turn to the third from the last paragraph. When the thermometer was below zero, Mr. Byer says, "So far as I could see with such a slight examination, the bees were for the most part below the honey." Exactly! and just what we have contended all along. When it turns very cold they will seek out these empty cells below the honey if they can find them. When it warms up they will move up on the sealed honey, just as Mr. Byer describes. There is no difference between us on these points.

In the next to the last paragraph he refers to Mr. McEvoy as having "every comb solid in September; so whatever clustering-space in the way of empty combs the bees have is made after that date." This is our practice, when we have time to feed early enough; and so far Mr. McEvoy is doing what we would do. It is probably true in Mr. McEvoy's case, that the clustering-space is made *after* the combs are fed up solid; for from the first of September till it turns continuously cold the bees can make quite a nice little winter nest; and in our locality they will form one about like the one we illustrated in GLEANINGS by about Dec. 1. If the bees are fed early enough (and all bees should be fed early when possible) they will make their own clustering-space, and that clustering-space will be about right as cold weather comes on.

The fact that bees in a natural or undisturbed state will make this space shows that we ought not go contrary to nature.

In one place our correspondent has misread us. He quotes us as saying "that the cluster of the strong colony will be reduced down to a space about equal to that of the doubled-up fist." What we actually said was this: "When the temperature pulls down to below zero, a strong colony will be compressed into a space about equal to a doubled-up fist." Notice, we put in the condition. But we will frankly say that what

we meant was the *double fists*, and we supposed that was the language until we saw "doubled-up fist" instead. At this point we stand corrected; but on the importance of the winter nest, and letting bees make it, and feeding the bees early enough so they *can* make it, we do not take back one word—especially so as our correspondent describes the conditions in his hives exactly as we find them, viz., that when it is cold his bees go down below the honey. And why? for the *very* purpose of getting their bodies together. When the weather warms up, the cluster spreads on the sealed honey just as they do in Medina.

We should be glad to have this question discussed by those correspondents who have opened up their bees during mid-winter, time and again, to see how the clusters are placed. In the mean time, while we have had letters confirming our position regarding the winter nest, we place just one of them, from a fellow-countryman of our correspondent, before our readers. He evidently has much the same conditions as those surrounding Mr. Byer; and yet his experience has been exactly ours as the reader will observe. He writes:

THE WINTER NEST BETTER THAN SOLID COMBS OF HONEY.

BY J. I. BEAUHRE, C. E. F.

I have read with interest the article by E. R. Root, "The Winter Nest of a Colony," page 19, Jan. 1. I have had similar experiences for a good many years, viz., that bees wintered on combs as described by Fig. 1 came out every year ahead, both in condition and amount of honey consumed, of those that were wintered on solid combs of honey. It seems to me that the bees spend more of their energy in heating these thick combs of honey. Bees will not waste their vitality in generating heat when they are separated by only a thin wall. But if they are wintered on combs that are solid with honey from the top-bar to the bottom-bar they will eat more honey in order to generate the necessary heat needed to warm up this solid mass.

Some bee-keepers notice this condition in wintering bees, but they do not pay enough attention to it; and some, even if they do pay attention to it, are not able to find out the cause.

A few years ago I read an article in GLEANINGS about the wintering of bees on solid combs of honey. If I am not mistaken it was a very hot argument between C. P. Dant, Dr. C. C. Miller, G. M. Doolittle, and several others whose names I do not remember. Being much interested in this I started out the following winter to find out for myself. The preceding fall I had six eight-frame colonies, three of which had solid combs of honey, and the other three, combs, as described in Fig. 1, p. 19. At one time I thought that the colonies in the last three hives would run short of stores: but on the

1st of April, the following spring, when I got them out of the cellar I was surprised to note the difference. The three colonies of lot No. 1, wintered on solid combs of honey, had eaten nearly twice as much. The colonies in lot No. 2, the preceding fall, weighed less than those of lot No. 1; but after wintering over, they had more honey to continue brood-rearing. The temperature in the cellar ran between 43 and 46 degrees all through the winter.

Since that year I have always tried to get the brood-nests in the same shape as described in Fig. 1, and I have always had success. Each of the combs next to the wall on each side of the hive is nearly solid with honey, the next two combs in the same order have a clear spot of about five inches in height and 8½ inches in length, the top having the form of an arch.

Ottawa, Can.

[Our Mr. Bain, who has had much experience in wintering bees outdoors at Medina and elsewhere, says he has repeatedly found that bees have died where the winter nest has been disturbed or eliminated entirely, just as cold weather came on. We have repeatedly observed the same thing; and Mr. Beaubre has had the same experience.—ED.]

NON-SWARMING STOCK.

An Extended Record of the Progeny of a Queen Whose Colonies Rarely Swarmed.

BY E. S. MILES.

In the fall of 1896 I purchased two queens of a well-known breeder, and introduced them to a couple of weak colonies, one of which, however, starved the winter following, as this was before I knew that a weak colony would consume nearly, if not quite, as much stores as a normal colony. The other colony came out strong in the spring, built up rapidly, and did so well in every way, besides storing more surplus than the average, that I was very favorably impressed with the queen; and when the bees wintered again perfectly, and were able to secure enough for a living, while all of my other colonies had to be fed between fruit-bloom and clover, I decided that this queen was the one I wanted for restocking my yard.

As this colony had not swarmed, and showed no signs of it, I was compelled to try my hand at queen-rearing. Up to this time I had been a believer in nature's ways, as a great many writers at that time laid great stress on the value of queens reared under the natural-swarming impulse, explaining further that the only perfect queens were those reared by nature's methods, etc. However, I then had the good fortune to get a copy of that masterly book, "Scientific Queen-rearing," by G. M. Doolittle, in which we are told how to rear the best of queens without violating nature. So I de-

terminated to rear some queens from this colony by the Doolittle plan.

The season proved poor, and I was bungling in my operations, so that I succeeded in getting only three colonies that season, headed with queens from this stock. The next winter I lost the original colony through a blunder; and as the season following was not very good I did not make much increase, but did get three more queens from the best of the first three queens that I reared the season previous. However, it was a couple of years before I began to notice that the colonies having these queens seemed not only capable of getting a living when common bees had to be fed, but that they did not swarm.

For about ten years after starting with this strain of bees, and until I probably had forty or fifty colonies of them, I had no swarms whatever, while fifty per cent or more of the colonies having queens of other stock in the same apiary swarmed, although they had the same treatment in every respect.

It should be mentioned that I make no effort to control the mating. I always try to prevent a heavy production of drones of undesirable stock, yet sometimes there were a great many common drones flying.

From 1901 to 1903 inclusive I reared a few queens from colony No. 74, whose queen was a granddaughter of the original queen. I may have lost the record of a few colonies, but I have a complete record of eighteen colonies whose queens were reared originally from No. 74. Of these eighteen, during 1901, '2, '3, fourteen did not cast a swarm, the other four swarming once each—three of the four casting swarms only when conditions were more than ordinarily favorable for swarming, and when all colonies of common stock were swarming excessively.

Of the progeny of No. 74 I selected No. 32 for a breeder, and I have before me the record of 79 colonies with queens from this No. 32, which were reared during the seasons of 1904 to 1907. Of the 79, 62 have not swarmed to date; 14 have swarmed once each, and 3, twice.

Now while it can not be truthfully said that this stock is exactly non-swarming, yet it must be remembered that, during all this time, I purchased and brought into this apiary over 50 colonies of common bees, besides having 25 or 30 colonies of various grades of hybrids. I have also purchased of breeders over two dozen Italian queens of different strains, and in addition to all these drawbacks I have not tried very hard, as I said before, to prevent common drones from flying.

Among these colonies that have not swarmed are some that have superseded their queen themselves, a few of which have done this more than once. For instance, the breeder No. 74 that was reared in 1900 was superseded in 1904, and the second was superseded in 1908, the third queen still being in this same colony. No. 132 is a daughter of No. 74, reared in 1903, and was super-

seded in 1907; and the second one is now in this same colony, and they have never swarmed. No. 9 is another colony which has the same record. No. 3, one of the first reared from breeder No. 32, never swarmed. She was superseded in 1909. No. 24 is one of the four daughters of No. 74 that I mentioned as swarming, yet this is hardly correct, for the original queen in No. 74 did not swarm, and she was superseded when four years of age; her daughter swarmed only when I was forcing the colony to finish sections by feeding. This season this same colony did not swarm, even under these conditions.

I also wish to say that, while I was breeding these queens, I was working primarily for bees that would do good work in sections, and that were not too cross. If I had been selecting queens especially for non-swarming alone I am quite certain I could have made more progress, for I was obliged to discard for breeders several colonies that were non-swarmers but had some other objectionable qualities.

Now, I have no queens for sale, and please let no one ask me whether I believe I can breed the tail off a sheep or cat, for I have never seen a bobtailed cat or sheep that had not been operated on with the knife; but I can produce a strain of hornless cattle if I have a good muley heifer. Likewise, if I tried to produce a non-swarming strain of bees I should want to start with a colony that would not swarm under normal conditions. I am convinced that a strain that is practically non-swarming is entirely possible. "Like produces like," whether color, shape, or disposition.

Dunlap, Iowa.

AN INCREASING DEMAND FOR COMB HONEY IN CARTONS.

The Opinion of a Comb-honey Dealer.

BY H. R. WRIGHT.

I should like to offer a few suggestions which may be of value to bee-keepers who have not yet ordered shipping-cases for the coming season. We know that there is an increasing demand for comb honey in cartons; and bee-keepers who use the proper style of cartons get the best and first sales. I do not recommend the closed thin paper-box affairs, for they have brought cartons into disrepute, as they are so quickly glued fast to the bottom of shipping-cases by the least dripping of honey, that they are generally torn to pieces when the honey is removed from the case. A stout, heavy, wood-pulp board carton, on the other hand, *with no top or bottom*, never sticks fast to the shipping-case. Such cartons pay for themselves in weight, as the buyer does not object to having the carton weighed with the honey. They need no glass front on the shipping-cases except on one section to show handlers the contents. Such cartons can be ordered of any paper-box facto-

ry to fit any particular size of section, and they cost about \$3.00 a thousand.

No change is necessary, except that the shipping-cases must be a little larger. About $\frac{1}{4}$ inch more for each section is needed lengthwise of the shipping-case, also sidewise, if no wedging space is ordinarily left.

Any section that weighs a pound or a little under is all right. There are very few sections now that weigh over a pound. The cartons are especially necessary where plain sections are used, for the honey, being flush with the edge of the section, causes abrasion of the cappings in handling, so that, when the grocer wraps the section in paper, it almost invariably reaches the consumer in bad condition.

Twenty years ago we were the pioneers in advocating sections weighing not over a pound, and this made a great improvement and increase in the sale and consumption of honey. We should now like to see a standardized case of honey holding 24 sections, and weighing from 22 to 24 pounds net, all sections being enclosed in these substantial cartons. This would save a lot of work, and would cause a honey-package to be as standard and as well known as a barrel of flour, etc. Odd sizes and different styles, varying according to the whim or notion of the producer, cause lots of confusion in the trade. Moreover, wholesalers are seldom able to duplicate an order with the same style, etc.

Shipping-cases need no non-drip bottoms. Corrugated paper is best, but ordinary paper is sufficient protection when these heavy thick cartons are used.

Albany, N. Y.

ANOTHER COMMUNITY HIVE.

BY LEON C. WHEELER.

In a late issue of GLEANINGS a description is given of a community hive, and the editor asks if any one else has had any experience "along this line." Several years ago I built a hive with this idea in view; and while it is, of course, not the same as the one described, still it is the same in principle. The original idea with me was gotten from the Ferris hive described in GLEANINGS several years ago. Instead of simply putting two colonies together, as Ferris did, however, I doubled the dose as the fellow did who thought that, if a small dose of medicine was good, more would be better. My hive was made to hold 24 frames on a side with a division through the center; in other words, there were 48 frames in the one body.

Other divisions were made in each side to make it into either four or eight compartments as desired. The big division through the center of the hive, and also the other cross-divisions, were all made partly of wire cloth, thus giving a free passage of air throughout the hive and giving a common

scent to all the bees. The first year I used it I started it with eight nuclei which built up till I had a hive running over with bees about the close of the clover-flow. The super I used was made to hold 26 frames on a side, or 52 in all, with free intercourse throughout the whole. This was accomplished in the case of the division through the center by means of little strips of wood set a bee-space apart, extending the whole length along the bottom and about $2\frac{1}{2}$ inches high.

This super, which I put on at the beginning of the buckwheat honey-flow, was filled full, and I extracted 127 lbs., if I remember correctly—nearly as much as that obtained from all the other colonies in the yard—as this was a very poor year for buckwheat. Since that year I have used the hive only for rearing nuclei, for which purpose it is very good; but I am confident that one could get an enormous amount of honey from it by starting in the spring with fair-strength colonies. This would be especially true in a poor year when the ordinary colonies would store but little. I rather expect to try it again next year any way.

To avoid trouble with queens getting in the wrong entrance I made some small entrances at the sides of the hive to use when mating, which gave two entrances at each side of the hive, and I never had any trouble with queens getting in the wrong entrance. Of course, if one were to use this hive for honey he would have to have a special apparatus to handle the supers, or else handle by frames. This would not deter me from using the hive, however, if I can get the extra honey which my experience would seem to indicate that one might get by the use of this hive.

THAT UNIVERSAL HIVE AND SECTION.

This is a subject quite thoroughly discussed by men better posted than I; but my choice of a hive is the old reliable ten-frame Langstroth hive with Hoffman frames; and I prefer the $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{2}$ plain sections. It would take quite a lot to hire me to change this combination, and I think you would find the same thing true in the majority of cases.

But we all have our own ideas, and I think you will find it's about like talking to the wind to try to get bee-keepers to see near enough alike to accept the same styles of hives and sections.

Barryton, Mich.

BEE-KEEPING IN MINNESOTA AND CALIFORNIA COMPARED.

The Profits in Either Locality About the Same.

BY F. A. GRAY.

For the past four seasons I have been personally operating my apiary in San Diego Co., Cal. I also have two apiaries in Minnesota, which, during this time, have been run by my two sons up to August 1 of each season, when I return to Minnesota and

take charge. I have been keeping bees in Minnesota the past fourteen years.

I can see no reason for giving southern California a black eye relative to the bee industry, for, on the average, large returns are secured every other year. I can not say why this is, but that has been the record of my apiary for the past twelve years, and a good year will give much more than any one season in Minnesota; but, taken as a whole, there is about as much profit in Minnesota as in California. In my vicinity the bees in California sell for about \$3.50 a colony in two-story extracting-hives. In Minnesota I can get from \$5.00 to \$6.00 in a one-story hive.

At the present time I do not think that California is overstocked. We have bees enough, however, for the poor seasons; but in good seasons many more could be kept on the same territory. I would advise any one who wishes to locate in southern California to buy out an established apiary, as many are for sale. While the bees gather honey any month in the year, yet the surplus is obtained usually only during April, May, June, and July.

Many will be surprised to learn that the reason for a poor crop is on account of too cool a season. My apiary is eight miles from the coast, and some years apiaries twenty miles from the coast get honey when I have practically a failure, the reason being that their locality is warmer. Rain, no doubt, is quite a factor; but all the plants are dry-weather plants, and very often with a little rainfall a good crop of honey is secured. Warm balmy air with heavy fogs in the morning gives a heavy flow of nectar.

Mr. Gibson has touched on a very important factor controlling the price of honey, when he speaks of the importance of cleanliness, proper grading, and the crating of comb honey. Far too many go into the bee business who are not adapted to it. Having been told there is big money in bees they try it for two or three years, then realize their mistake, go out of the business, usually after experiencing a loss. Bees in any country must be run on a business basis, the same as any thing else. A yield in one season of twenty dollars per colony will get a lot of people into the business when they know nothing about it; but they think they can do the same the next season, when, in fact, this yield comes only a very few times in the life of an experienced bee-keeper.

Let no one be deceived about the amount of work required with bees in southern California, at least during the honey-flow. It is necessary to begin to extract on Monday morning, and keep it up until Saturday night, and during a heavy flow this is hard work. Tiering up does not answer here as in Minnesota, for the honey becomes too cold to extract unless it is close to the brood-nest. I have found that the bees can not be run the same in California as in Minnesota, for new tricks have to be learned. All these things, of course, cost money.

There are some good locations for bees in San Diego Co. at the foot of the mountains. However, they are so far from the market that I would not care to take them up. In locating an apiary, I know bee-men usually follow the golden rule—that is, doing to others as they would be done by. This certainly pays, for otherwise failure is the sure result. More capital is required in California than in the East, the reason being that there must be supplies on hand for a big crop; and if there is an entire failure the supplies must be carried over for another season.

Redwood Falls, Minn.

BEEES AND COLORS.

Some Proofs that Bees are More Hostile to Black Clothing than to White.

BY M. E. PRUITT.

On one occasion we had dealings with an enraged colony, and I thought I would just pull a couple of black stockings over my hands (not being able to find my gloves at the moment), so that I could replace a couple of frames and put on the cover so that they would not so easily detect the scent of stings already received. Oh how I wished I hadn't! They just simply covered my hands; and when I retired from the field the color of my "gloves" was changed from black to pepper-and-salt.

The year before last I was wearing a navy-blue skirt, and the bees seemed to delight in puncturing it. I changed the navy blue for a light tan, and all was peace.

We have a Holstein cow; and every time she passes by the yard, and the bees are irritated, they invariably make for the black spots.

When we are hitching up the sorrel and the bay horse I notice they begin operations on the black mane of the bay. When we have the black horse and one of the others together, the black comes in for the most points.

Our white chickens are not molested when scratching in the yard; but the Minorcas are allowed to stay hardly long enough to locate a hunting-ground.

When bees want to sting a person they generally make for the shaded parts, such as about the eyebrows, behind the ears, and in the nostrils; and, oh what a tender spot that is!

Eola, Texas.

About that Wasp-nest in a Section of Honey.

In regard to that cut of a wasp-nest in a section of honey, page 16, Jan. 1, I will make these assertions: 1. That wasp was what is known as a mud-wasp or mud-dauber; 2. The nest was put there when there were no bees in the super; 3. The wasp never passed through the brood-chamber in its trips to and from its nest, as bees and wasps do not harmonize.

Rocky Ford, Col., Jan. 9.

A. S. PARSON.



THE OVARY OF THE QUEEN-BEE.

BY DR. BRUENNICH.

All human beings, as well as plants and animals, were once nothing but one very small cell composed of a membrane, a nucleus, and a little protoplasm. There is almost no difference between the embryonic cell of an elephant and that of a tiny fly. By continual division from that single cell, two are formed; then four, eight, sixteen, etc., until there are millions, and with the multiplication of the cells their qualities and offices begin to differentiate themselves until the wonderful being is built up. In the first little cell there is latently contained the whole future animal with all its varying psychic qualities. Is there on the face of the earth any thing more mysterious and wonderful than this minute cell, whose diameter is perhaps not more than $\frac{1}{200}$ of the width of a line?

Among the higher animals—insects included—the eggs are formed in a double organ called the *ovary*. With the help of the illustrations let us look somewhat closely at the ovary of the bee. The queen, beneath the back of the abdomen, possesses two ovaries, each of which is composed of about 200 fine threads of its own contexture. For the beginning, near the breast the thread consists of cells of the general character, the mother cells; then comes the differentiation into two different shapes, the *eggs* and the *dodder-cells*, which alternate to the end. The dodder-cells are made up of a conglomerate of little cubes of albumen, in the form of a lengthened egg. These are for the purpose of nourishing the eggs and furnishing the necessary reserve (albumen); for, as we all know, the little embryo lives and develops for three days on this albumen only, without the help of nurse bees.

To every dodder cell there belongs an egg, as the figures show distinctly. The eggs, like the dodder-cells, are very small at the beginning, but at the end they reach their full size; neither, however, changes in general structure. The egg consists of the little embryo (nucleus), the dodder-substance, and the membrane. The latter is formed of thousands of prismatic cells (epithel), with chitinous membrane, each with its kernel (nucleus), and represents an elastic, rather firm and fine skin which serves to protect the egg from outside injuries. Where the front end of the egg touches its nutritive cell there is a small hole where there are no epithelial cells, this hole effecting the communication between the dodder-cell and the interior of the egg. After the egg is expelled with its dodder-cell, this hole is the so-called *micropyle*, the only spot where the spermatozooids can penetrate into the interior. Immediately after this process (fecundation) the surrounding epithelial cells join closely together and thus shut the hole.

The eggs at the end of the thread are the ripe ones, which are successively expelled.

In the meantime the others follow, their places being taken by new ones that are formed from the young embryonic mother-cells at the beginning of the thread.

The room between the different egg-threads is filled partly with blood and partly with a tight web of tracheas whose finest terminations spin around the egg and dodder-cells.

In dissecting a fertile queen the ovaries may easily be seen, for they are about the size of a pea. Without a magnifying-glass one may see the little moniliforms. The ovaries of an unfertile queen are not as easily seen, as they are less solid and much smaller, both the eggs and dodder-cells being shorter and thinner. But far more insignificant still are the ovaries of the worker bee, which normally can not be seen, for they are too minute. In case of a laying worker it is possible to find the ovaries with some preparation; but they are also very slender, consisting of only about ten of the above-mentioned egg-threads.

Rheinau, Zurich, Switz.

BEE-KEEPING FOR BEGINNERS, ILLUSTRATED.

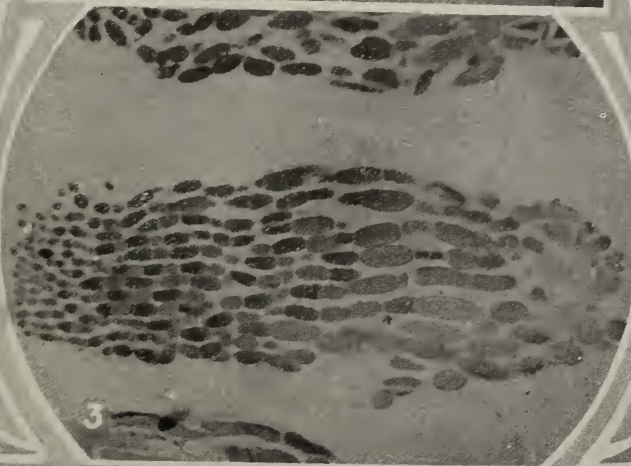
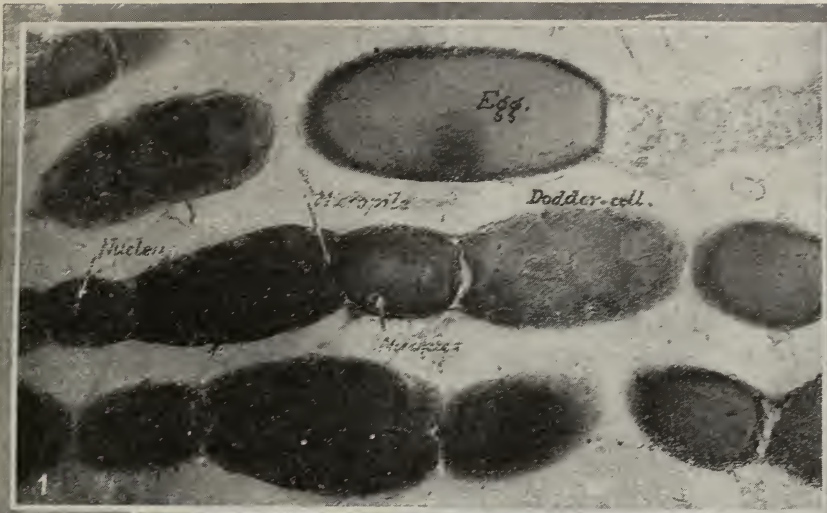
Ten-frame Hives the Best for Either Comb or Extracted Honey Production.

BY E. D. TOWNSEND.

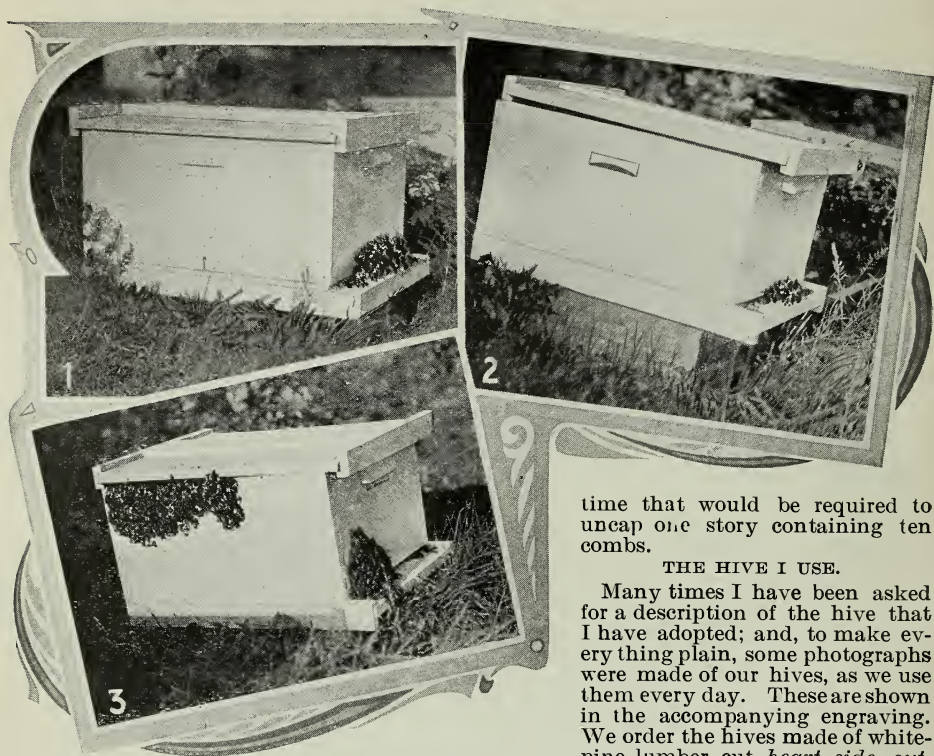
What hive to adopt is always an interesting proposition. A few years ago I thought that the solution of the question depended upon whether one produced comb or extracted honey, and at that time I would have recommended an eight-frame hive of Langstroth dimensions for comb honey and a ten-frame for extracted honey. Now, after having had experience with the ten-frame hive for comb-honey production, I advise that size for both comb and extracted honey production. A frame of Langstroth dimensions (17½ inches long by 9½ inches deep) is the one that I would recommend for either comb or extracted honey. If a frame shallower than the Langstroth is used, pollen is likely to be stored in the sections in the supers above. Of course, this may be avoided to some extent by an expert, as he is able to arrange the supers and manipulate them on the hives so that little pollen gets into the sections; but when these shallow hives get into the hands of the majority of comb-honey producers, trouble begins. A frame of Langstroth dimensions is as shallow as I should like to use in a brood-chamber, and deep enough for an extracting-super.

HOFFMAN FRAMES FOR BROOD-CHAMBERS.

We are now using both loose hanging frames and Hoffman frames side by side in the brood-nests; but we are now buying nothing but the Hoffmans, as they are better for our methods of management than the loose frames. A somewhat different style of frame is used in the super or upper



ENLARGED VIEWS OF THE EGGS AND DODDER-CELLS IN THE OVARY OF A QUEEN.



THE TEN-FRAME HIVE AS USED BY E. D. TOWNSEND.
Fig. 1 shows the old form, and Figs. 2 and 3 the new. The last two also show the cover raised for ventilation.

story, however, than in the brood-nest, for our extracting-frames do not have the wide end-bars that form the self-spacing feature of the Hoffman, but, instead, they are $\frac{3}{8}$ inch wide clear around, including the bottom-bars, hence they are what is known as the hanging or non-spaced frames. Such a frame has no projections to hinder the uncapping-knife, which is a valuable point. Then one may use just as many or as few in the upper stories as he sees fit, as they are spaced by hand.

We use eight of these frames in our extracting-supers, which are $14\frac{1}{4}$ inches wide, the usual ten-frame size of hive. As the eight-frame hive is usually built $12\frac{1}{2}$ inches wide, seven frames is a desirable number for such an upper story. There are several reasons for the wide spacing of the extracting-combs, the most important one being that the combs are thereby built out beyond the edge of the frame, so that they are "fat." Another reason is that, instead of ten, there are only eight combs to uncup and extract; furthermore, more wax is secured with the cappings than if only a very thin layer were removed with the knives, as in case of thin combs. In our experience, two ten-frame stories containing eight combs apiece may be uncapped in the same

time that would be required to uncup one story containing ten combs.

THE HIVE I USE.

Many times I have been asked for a description of the hive that I have adopted; and, to make every thing plain, some photographs were made of our hives, as we use them every day. These are shown in the accompanying engraving. We order the hives made of white-pine lumber cut *heart side out*. This means that, if there is any warping of the lumber, there will be no spreading apart at the top and bottom of the corners—the opening, if anywhere, being at the center, where it is easily nailed up. The truth of the matter is, however, if the lumber is put together with the heart side out, and fairly well painted, there is no gap staring one in the face every time he looks at a hive. Most of the large hive-manufacturers have seen the importance of this, and, as far as possible, are cutting all material heart side to the weather.

Hive No. 1 in the illustration is of an older pattern, showing the old style of Excelsior cover and a $\frac{3}{8}$ -inch-thick bottom-board. Nos. 2 and 3 are of the latest pattern, and are of the style that we are now buying. They are regular stock hives as manufacturers list them, except that the longitudinal piece at the side of the bottom-board is made the whole length of the bottom-board.

Aside from the greater rigidity of this bottom, there is a much better opportunity for fastening the bees in while moving. As the width of the bottom inside of the side pieces is the same as the inside width of the hive ($14\frac{1}{4}$ inches) pieces of lath $14\frac{1}{4}$ inches long are nailed securely, with *3d* wire nails, to the front of the hive so that the edge extends down to the floor of the bottom-board, thus closing the entrance. This prevents the hive-body from "shucking" sidewise

while being moved; and, even if there is a slight movement lengthwise of the bottom-board, no bees can get out, as the entrance-block slides with the hive and is held in place by the above-mentioned side-pieces.

We use no division-board or follower in our hives, the inside furniture consisting merely of the ten self-spacing Hoffman frames as they are regularly listed.

We have some covers so built that a thin inner cover is necessary, so that two covers have to be handled at each opening of the hive. There may be some advantages in these double covers, but we have decided there is not enough in them to offset the extra work of handling two instead of one. The Excelsior covers as shown in the engravings are very good, and we are now buying that style exclusively.

VENTILATION DURING HOT WEATHER.

In Figs. 2 and 3 the covers are raised a little and slid forward until the rear cleat rests on the back of the hive-body. This forms a V-shaped opening the whole length of each side of the hive. This is the way that we ventilate our hives during the time between taking off the early white honey and the darker fall flow (in those locations where we get a late flow), and also in locations where no supers are put on the hives after the early white honey is removed. This ventilation is needed during the hot weather following the white honey-flow, for the colonies are rather strong in numbers at this time of the year; and if we were to crowd the bees into a single story they would cluster out on the front. We also follow this same plan for ventilation during extremely hot weather during the honey-flow.

While all, or nearly all, of our hive-bottoms are reversible, one side having a $\frac{3}{8}$ -

inch entrance and the other $\frac{7}{8}$, we use the $\frac{3}{8}$ -inch side exclusively, depending upon the ventilation at the top, as described, when needed, as we think that the smaller entrance is better at other times. It must be remembered that I am not writing for locations or states south of me, but for my own location, where there are but few hot days when there is need of more ventilation.

Remus, Mich.

BEE-KEEPING IN THE HIGHLANDS OF MEXICO.

Yucca-trunk Bee-hives; Running Bees for Wax Only; Bitter Honey.

BY O. B. METCALFE.

Continued from last issue, page 50.

My next stop after leaving Monterey was at San Luis Potosi. Here I soon learned, by making inquiry, of Mexicans about the park, that there were some bees kept in the city, but that in the low hot lands toward Tampico there are a great many bees and professional bee-keepers among the natives. However, I could not learn of a single modern bee-keeper in that region. It seems that the native bee-keepers run bees more for wax, the honey being of an inferior quality.

For a few cents I hired an old Mexican to conduct me to the house of a professional bee-keeper who spends part of the time in San Luis Potosi, and keeps a few stands of bees there, but who has the bulk of his bees at Liones. Figs. 1, 2, 3 were taken at his home in San Luis Potosi, and show, according to all accounts, the type of hive used in the Tampico region.

Fig. 1 shows the arrangement of the hives

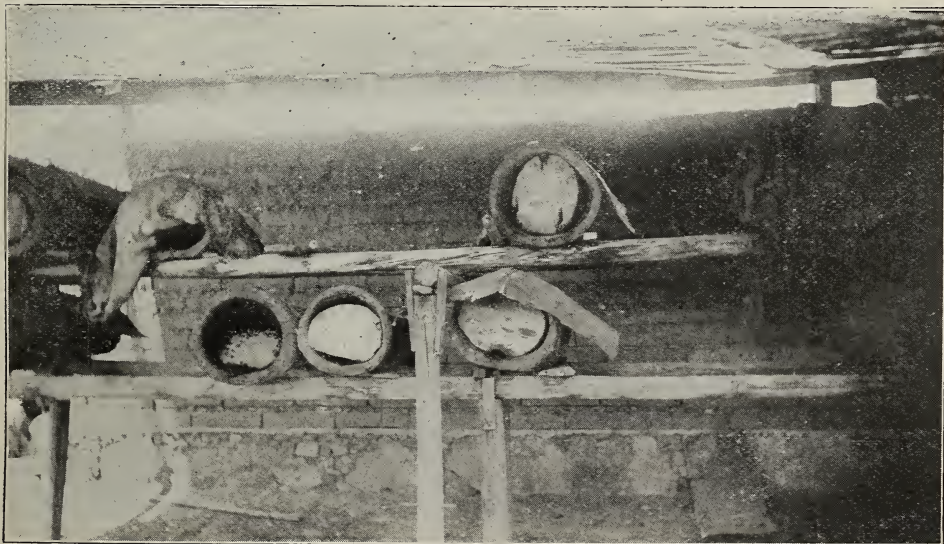


FIG. 1.—YUCCA-TRUNK BEE-HIVES AT SAN LUIS POTOSI, MEXICO, SHOWING ARRANGEMENT OF HIVES ON SCAFFOLD ALONG ADOBE WALL.

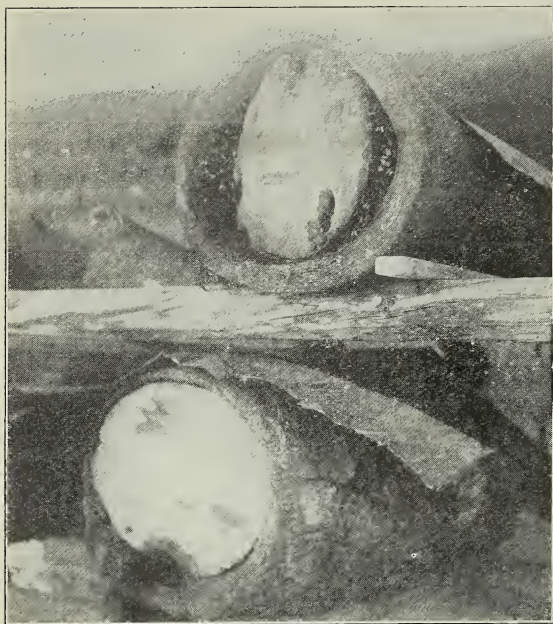


FIG. 2.—BEES CLUSTERED IN THE FRONT OF YUCCA-TRUNK HIVES AT SAN LUIS POTOSI, MEXICO.

on a rack against an adobe wall. They are commonly kept in this manner except that they are not always along an adobe wall.

Fig. 2 shows fairly well the structure of these Mexican hives. The trunk of a yucca or a small palm is cut off about four or five feet long, and hollowed out. In this the swarm is hived and a plug of the same material is set in front to keep out most of the weather. Over these spongelike hives some water-shedding substance is spread to prevent the rain from soaking them. Fig. 3 shows one of these hives with the end plug taken out and the bees smoked back so as to show the natural honey-comb. The bees build from their brood in the middle both ways; and when the hollow is full to both ends the Mexican bee-keeper is ready to "take off honey." Beginning at the large end shown in the cut, the operator keeps smoking the bees back and cutting out the honey until he reaches the brood. If he is a practical bee-keeper he leaves the honey in the little end for the bees at all times.

These yucca-trunk hives are much more practical than they would at first sight appear, and the owner of the ones shown in the cuts claims to get from them an average of from 180 to 240 lbs., according to the season. I can see easily enough that, with these hives, which cost nothing but a few minutes' labor, a great quantity of honey could be taken with little expense. If the honey were of too low a grade to sell, it could be fed back to the bees, and the wax sold at the good price it brings in Mexico. There were, however, some two or three carloads

of honey exported from Tampico this year, and that shows that some of it, at least, is salable at some figure. As to the bees making from 180 to 240 lbs. per colony, I have my doubts; for, by talking a long time about times of taking honey, etc., with the old man I am speaking of, I surmised that he really got about half that amount.

As I have said before, this old San Luis Potosi bee-keeper has bees at Liones, about 100 miles away. He claims that at Liones the honey is made mostly from a weed which grows abundantly on the hills, and that it is so bitter it can not be eaten, and that, therefore, he runs his bees there exclusively for wax. So here I had found a bee-keeper who kept bees for the production of wax only. I was at once very much interested, for this was one of my Mexican get-rich-quick ideas; but as soon as I began to talk to this old man about his methods of rendering wax and preparing it for market I saw that the plan had been pretty well tried, for there seemed to be little that I know

of modern wax craft that he did not know, even to the bleaching of beeswax in thin sheets by sunlight. They melt up the honey and wax after straining out what honey they can, and then dip off the wax, about as we do. The refuse is then transferred to strong sacks which are securely fastened by one end to a tree or post. A small strong stick to twist with is then folded in the other end, and the sack is wrung as long as any wax drips. As the pure wax begins to cool, wet boards are dipped into it and the thin scales of wax which adhere to them are scaled off and laid in the sun to bleach. In this shape it brings the best price for making candles to burn in the churches. They all shake their heads, and say there is no supplying the demand for this wax at \$1.00* per pound.

Leaving San Luis Potosi early in the morning I had a splendid opportunity to study the flora as we traveled south toward the city of Mexico. Very soon after leaving San Luis Potosi the railroad is along the edge of a great valley in which there are many farms, and a few alfalfa-fields are seen here and there. Getting off at the numerous stations I learned that a few colonies of bees were kept all along. At Jaral de Berrios I was told that a good many bees were kept, but that the honey was dark and strong. The Mexican I was talking to on the station platform said that some ate the honey, but not many, and that it would not sell. He said they took the wax to San

*Equivalent to 50 cts. in American money.

Luis Potosi, and that parties there made the profit on it. At this point I noticed all along the foothills a growth of yellow weed—a strong shrubby perennial something like the yellow dock from which our bees make a strong yellow honey in the fall. I imagine that it is from this weed that the bees along this valley make the bad honey.

Further on, the railroad climbs out of the valley on to a high tableland country, and in places there were patches a few miles square completely covered by a diminutive sunflower. It did not grow over a foot high, but was evidently of the genus *Helianthus* with our common sunflower, and I should think that bees would do well on it in the fall.

About the line of the state of Guanajuato, which is one of the most fertile states of the republic, among the highlands, I saw the first chayotillo plants, but not enough in any one place for a bee location. The chayotillo plant is, perhaps, Mexico's greatest honey-plant, and in another article I expect to discuss it and give a picture of it.

Mesilla Park, New Mexico.

EUROPEAN FOUL BROOD.

A Study of the Conditions and Environments which Have a Bearing on the Cure. An Explanation of a Great Many Failures.

BY F. B. CAVANAGH.

In Three Chapters. Chapter One.

When we located at Hebron, two years ago, it was with a certain knowledge that European foul brood, commonly called black brood, existed in the vicinity. At that time our law had not been passed providing for an inspector, and black bees were suffering considerably from the disease. One fact stood forth, however, that honey crops were still being secured, and this decided me in coming here. I took the chance, trusting to my past experience in shipping bees to abridge my supply in case the disease reduced the number of colonies. Friends thought the move a mistake, which it no

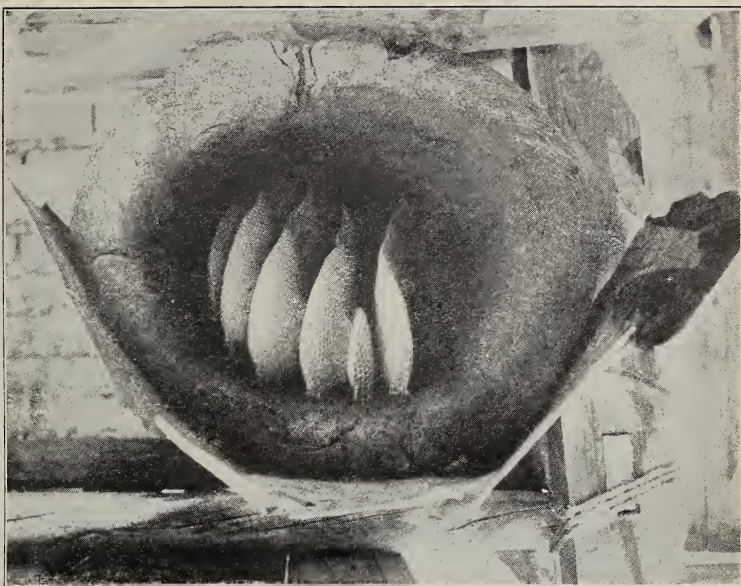


FIG. 3.—NATURAL HONEY-COMB IN YUCCA TRUNK HIVE, SAN LUIS POTOSI, MEXICO.

doubt was from a rational standpoint. However, not being built on rational lines I wanted to "know" from actual experience—to "beard the lion in his den," as it were. I therefore shipped some 300 colonies into that diseased location, all of which were healthy. Believe me, though, that lion was the most ferocious monster I had ever met, and it had me badly scared before the summer was half over, although I did not cease fighting.

As I relate the following experience with European foul brood it is with the realization that I have been favored in many ways. Our foul-brood law, recently passed, has proven efficient under the splendid organized work of our inspector, Mr. Demuth. The disease has, by the application of advanced methods, and with Italian bees, proven more easy to cure than I at first anticipated. While we have secured but little honey during the past two years, I am glad to have had the experience of winning a real battle with the disease; and the following is given with the hope that it may help other bee-keepers to defeat the enemy.

During the spring of 1909 I made the following shipments: About April 20 the Aylesworth yard of three-banded golden Italians, Cyprians, Carniolans, and Caucasians; May 20, the George yard, from Wisconsin, which was excellent stock, about half dark hybrids and the rest three-banded Italians. June 5 I purchased the Berdine yard of 50 hives, about half Moore's strain and the rest dark hybrids. In all there were about 300 colonies, all of which were healthy.

The disease soon made its appearance in every yard; but in each case I was sooner or later advised by some neighbor that my

bees had robbed his hives. Also in every case, when inspecting later, I found these neighbors' yards diseased. My bees, being principally Italians, were easily identified, and lined to the nearest apiary. Realizing now that the location must be cleaned up if a permanent cure were made, I finally consented to act as deputy inspector, covering as much territory as possible surrounding my yards. This trip, unfortunately, caused some temporary bad feeling among neighbors who failed to grasp at once the intent of the law; but, happily, the work proved a success in eradicating the disease.

We used the McEvoy treatment entirely, and also required disinfection of hives by burning them out after burying the diseased combs. Black bees prevailed in these small apiaries; yet where the work was faithfully performed I know of no failures in the cure.

My story shall deal principally with experiments, systems, and results, actually obtained in my own and neighbors' apiaries. I shall draw some conclusions and advance some *theories*; but the latter, however, are given merely for what they are worth and with the earnest hope of contradiction and correction by any brother who may know better; for as yet we are too ignorant of this disease to be sure of theories.

Dr. Phillips and Dr. White, at Washington, D. C., are studying the disease from a bacteriological standpoint. It has proven a tough proposition, acting in most uncertain and unreasonable ways. As Dr. Phillips aptly remarks, "The man who knows the least about the disease, usually thinks he knows the most." When the work at Washington shall have been completed, the exciting cause determined, and other intricate problems worked out concerning bacilli and spores, we may then learn things which will call for material changes in our treatment. We now know that, when we do certain things under certain conditions, the disease becomes cured; but having, perhaps, done several things, or having done the same thing under peculiar circumstances, we can, in reality, only conjecture the real cause of the cure. Until these problems shall have been worked out, therefore, we can not afford to accept too seriously a mere theory.

SYMPTOMS OF EUROPEAN FOUL BROOD.

Early stages show an occasional dead larva (unsealed) apparently about four or five days old, and which is slightly yellow or cream-colored. Sometimes the larva will extend the length of the cell in a partially dried-down dark-colored scale. Mature brood may be found hatching, but there will be scattering open cells in the midst where larvæ have died and been cleaned out. The unsealed larvæ are invariably the principal sufferers.

Advanced stages show only an occasional young bee hatching and but little sealed brood; some cells will be found containing dead larvæ with the cappings broken into, and the diseased combs filthy and ill-smelling. The majority of cells will be found un-

sealed, containing dead larvæ in all stages, and varying from a yellow to a dark *muddy* color. The older larvæ slump into a shapeless irregular mass on the bottom or side of the cell, while the younger ones are sometimes curled up in a natural position. In rare cases the mass will rope out for about half an inch, but never any thing like American foul brood. Also the diseased matter occasionally assumes a salve-like granular appearance. It is then almost chocolate-colored and ill-smelling, and it lies on the bottom of the open cell.

Where the disease has been treated, mild returning cases may be detected most surely by a scattered appearance of the brood. This condition is usually found among Italians which are doing a good job of cleaning out dead larvæ, but whose queen is not up to standard. Such colonies should in no case be overlooked, for they are not only unprofitable, but they are sources of future danger and contagion as well.

ELEMENTS OR SOURCES OF CONTAGION.

Infected honey is, no doubt, the principal cause for the spread of this disease from one apiary to another. In my yards, in every instance it was started through easily traceable robbing. Mr. Simmins, an English authority on European foul brood, suggests that the infection may be carried on the bodies or feet of the robbers by reason of their fighting in masses over filthy brood. He also suggests that honey might be mixed with material from diseased cells if these combs were extracted. No doubt honey on the market might be thus infected; but I dislike very much to think that any bee-keeper would violate a pure-food law, and, furthermore, a law of common decency, by extracting and selling honey from combs containing diseased material. However correct this theory may be, I feel satisfied that there are times when honey may be infected in other ways than the above, and I offer the following examples as positive proof that colonies *under certain conditions* will contract European foul brood from diseased honey. One bee-keeper in southern Indiana fed his bees honey which was purchased of Mr. Alexander about the time the disease was in his yards. Another case was brought to my notice where a small dealer in honey allowed the bees to clean out cans in which he had purchased honey. The infection which was started in the apiaries of these men was clearly of this origin, for no such trouble had ever been known in the vicinity of either. Admitting, as we do, that these men were extremely careless, let us forever explode the theory that the germs of European foul brood can not be carried and transmitted to bees through the medium of honey.

During the inspection of Indiana, in 1909, our force found that about one-half of the new swarms from diseased apiaries carried the disease with them, or at least they showed it at the first hatching of brood. Was the disease carried in honey? did the nurse bees carry it? or was it transmitted in some other way? Those who have had experience

are entitled to several guesses on these questions.

Another element of contagion we found in old combs which had contained diseased larvæ when the bees had died. A small bee-keeper had sold hives having a small piece of this comb attached for "a starter," and which proved to be a fine "starter" for foul brood, and that with the first hatching. Remember, then, that, while combs can be cleaned out and safely used by methods I will give later, until this is accomplished they must not be used from a colony that has died in a diseased apiary—at least, not for hiving new swarms thereon.

Disease is spread in the hive through the nurse bees eating the juices of the dead larvæ while cleaning them out. I have seen as many as three at a time doing this, and, as Dr. Miller suggests, the infected milky fluid is no doubt fed back to other unsealed larvæ, thus giving them the disease.

Here we have at least three mediums of contagion—honey, old comb, and diseased larvæ. How many more there are is difficult to surmise; but it seems certain that the disease is transmitted through the air from one hive to another. Frequently I have found one-half, more or less, of a row in an apiary where nearly every hive was diseased, while the remainder of the row were almost entirely free from the trouble. Also some very weak colonies in the George yard, which were practically used up by poor wintering, followed by long confinement in shipping, became the worst diseased soon after the strong colonies had developed the malady from robbing.

Hebron, Ind.

To be continued.

THE HAND SYSTEM OF CONTROLLING BEES.

How to Manage when All Colonies are Strong May 1.

BY J. E. HAND.

I have received the following inquiry from a subscriber whose home is in New York. As there may be others who would like further information along the line mentioned in his letter I will reply here. The communication is, in substance, as follows: "I am especially interested in the Hand system of controlling bees as described in recent numbers of GLEANINGS. Now, Mr. Hand, in case you had 100 colonies in sectional hives all strong May 1st, with a fair prospect of a copious honey-flow, how would you manage them for the production of comb honey with no increase?"

In the first place, the condition that you mention, that of having 100 colonies all strong May 1, would be an abnormal one for the latitude of New York, where beekeepers as a rule consider themselves fortunate if 75 per cent of their colonies are in that condition by May 15. At least that is the condition that usually prevails in North-

ern Ohio, which is considerably south of New York. However, if we had 100 colonies in the condition mentioned May 1st or 15th, we would lose no time in giving them each a third division to increase the capacity of the brood-chamber; if nectar were being gathered in excess of present needs I would provide also a super of extracting-combs above a queen-excluder, for these strong colonies must not be allowed to contract the swarming fever at any time, and especially at this stage of operations.

When the harvest from clover has nicely begun, and the prospect bids fair for a copious flow followed, perhaps, by another from basswood, let no one wait until the bees are on the verge of swarming, but nip the swarming impulse in the bud in the following manner: Assuming that each colony is provided with a double switch-board, place the top division, containing honey and bees, but no brood, down on the vacant side of the switch-board beside colony No. 1. Exchange the central comb for a comb of brood and bees from No. 1, including the queen. Upon this division place another, containing frames filled with foundation; put on a queen-excluder and a super of sections, and throw the switch. In 48 hours practically all the flying bees will have joined the new swarm through their accustomed entrance, and all that will be left in No. 1 will be a hive full of brood and a lot of young bees that have not yet flown from the hive, which will be sufficient to care for the unsealed brood. However, if the nights are cool, and it is feared that some of the brood might perish for want of bees to maintain a normal temperature, one of the safety-valves on the side should be opened a few days before shifting, to retain sufficient bees to meet the exigency, so that no brood is lost.

In about a week there will be a considerable force of young bees flying from No. 1, which are in turn switched over to re-enforce the swarm, which will be continually increasing in numerical strength during the next three weeks. At the time of making the second shift, place a specially constructed bee-escape in the entrance of No. 1 back of the switch-lever, which is pushed up tight against it. The exit from this discharges the bees close to the main entrance, into which the returning bees from No. 1 must enter, since no bee can again enter that hive. When the brood has hatched and the bees have all been transferred to the swarm automatically, the hive and combs may be used as desired.

If there is any foul brood in the apiary, this system will eradicate it without any extra manipulation, and without interfering with the honey crop; in which case, however, we would use full sheets of foundation in both divisions of the new hive and make sure that the comb of brood came from a healthy colony. Thus by working in harmony with the instinct of bees we pay tribute to nature. The swarming instinct is satisfied, and the bees are placed in that highly desirable psychological condition

that is essential to best results in honey production, and which can neither be produced nor maintained in any other way.

In case full-depth hives are used we would place upon the hives early in the season a full-depth upper story of extracting-combs above a queen-excluder, which, at the beginning of the harvest, is used for a new brood-chamber exactly as above described.

The secret of successful swarm control is not in swarm *prevention* (a thing that exists only in the minds of brainless philosophers), but, rather, in swarm *control* by *forestalling* the event by substituting the artificial for the natural.

Birmingham, Ohio.

BEE DEMONSTRATIONS ONE OF THE FREE ATTRACTIONS AT A STREET FAIR.

BY M. E. BOND.

At our street fair last October I gave demonstrations with bees every day, a feature which was advertised at 4 P. M. for each day in the printed programs, together with high dives, bicycle dives, etc., at other hours in the day.

My cage was 6 ft. square and 6 ft. high, and was made of inch strips covered with wire cloth. It was erected in the center of the street on a platform supported on trestles, which placed it above the crowd. For the demonstration I used a colony of black bees that I purchased from a neighbor; and as there was brood in all stages I made special explanations in regard to it, and the crowd seemed to appreciate it very much when I told about the time required for the bees to hatch, mature, etc.

Each day I shook the bees from the combs in a large pan, and tumbled them around in the pan until they would form in a ball, then put a ball of bees first in one hand and then the other, then in my hat, and finally I placed the hat on my head. I then threw my head back and shook the bees into my mouth, at which moment the crowd held their breath, thinking I would be stung to death. I had paper cones, like ice-cream cones, that I filled with bees and offered to sell, etc. I wore a thin gauze shirt with two-inch sleeves fitting tightly about the arms. It had a low neck, but there was little chance for bees to get under it. I also had bicycle-guards on my trousers, so that the bees could not crawl up.

By giving the bees a few puffs of smoke at the entrance before opening the hive I had no trouble in doing any thing with them that I wished. I made the demonstration for four successive days, closing the entrance in the evening with wire cloth and keeping it closed until I was ready to make the demonstration the next day. I was obliged to do this, as I kept the cage covered all the time.

Some said I had taken a vinegar bath, and others thought the bees were chloroformed. Some one started the story that I had clipped the stings from the bees; but

when I offered them a handful they declined to accept them. I exhibited modern hives, together with tools and materials used; and the last day of the fair the street was so crowded for a block that many could not get close enough to see.

Winimac, Ind.

MINNESOTA BEE-KEEPERS' ASSOCIATION.

Report of State Meeting.

BY C. A. PALMER, SEC.

Those who attended the sessions of the Minnesota State Convention in Minneapolis, Dec. 7 and 8, 1910, returned to their homes happily conscious of having learned much in regard to obtaining more than ordinary crops of honey.

The program was certainly well stocked with pointers from professional men. E. L. Hoffmann, of Janesville, who secured, during 1909, from his 100 colonies, an average of 100 lbs. of honey per colony, was present, and explained his full method. Mr. Hoffman is an enthusiastic student of bee culture, and his knowledge of methods practiced by prominent bee-men of the country, combined with his own lifelong experience, makes him especially interesting as a speaker, and helpful in answering questions.

Dr. L. D. Leonard, of Minneapolis, gave an explanation of his method of getting rid of foul brood. Those who heard Dr. Leonard could not doubt that his unique methods solve this vexing problem successfully. It is a method very easy to follow, besides.

Both these papers were strengthened much by the fact that the speakers made use of actual hives with frames of comb and all other fixtures, except the bees, to make their meaning unmistakable. The talks were thus real demonstrations.

A great deal of interest was also elicited by the demonstration given by C. F. Greening, of Grand Meadow. He used small hive models to show his way of getting the greatest amount of honey from the smallest number of colonies with the least work, and also to show his plan of controlling swarming. An effective commentary on the success of Mr. Greening's methods was the fact that Lyman Smith, of Wayzata, who had Mr. Greening a year ago, put the plan into practice the past season, and was rewarded with 2000 lbs. of honey from only ten colonies.

A committee was appointed to consider needed changes in the State law concerning foul-brood inspection. Action was also taken looking toward the securing of recognition for the bee-keeping industry in Minnesota by the creation of a chair of apiculture in the Agricultural College.

The association endorsed the resolution passed by the National Association at the conclusion of President York's address at the Albany meeting. The Minnesota officers feel hopeful that the next National meeting will be held in this State.

St. Paul, Minn.

Our Homes

By A. I. Root

Who forgiveth all thine iniquities; who healeth all thy diseases.—PSALM 103:3.

For he knoweth our frame; he remembereth that we are dust.—PSALM 103:14.

Wherefore let him that thinketh he standeth take heed lest he fall.—I. COR. 10:12.

A few days ago my heart was made glad by the sight (once more) of some of the familiar handwriting of our good friend E. E. Hasty, and here is the letter:

Brother Root.—Yesterday's GLEANINGS, where you confess to such a bad memory, moves me to write you about the subject. We too easily settle down in the belief that it can't be helped. I feel convinced that to a certain extent it can be helped. You are among the foremost (*à la* Terry and others) to help the body's disposition to go to the bad. Is the body of so much more value than the mind that it must have *all* the propping up, while the mind goes completely to pieces with no effort to save it?

Some three years ago or more my memory got into a desperately bad condition (*couldn't* shut the milk-valve before I strained the milk in); utter inability to get along with the daily duties of life seemed just ahead; and a solemn feeling that something *must* be done about it came upon me pretty strong. Not far from the same time I read some remarkable articles in a magazine written by a doctor in Philadelphia. The gist of the matter was that the failure of the faculties could be halted, and in some measure recovered—yes, better memory and better senses and better thinking be secured by persistent massaging of the head and neck.

Well, I went in pretty strong; have kept it up ever since, with brief intervals. As for results, I must admit that my memory is still pretty bad; but I think it is not so extremely bad as it was three years ago. And surely to have prevented the natural further deterioration for the three years between 67 and 70 is doing a good deal.

The why and wherefore of the thing was not put into very clear words in that doctor's papers; but I take it to be something like this: A refreshed and aroused condition of living tissues *tends to communicate itself* to tissues nearest by; and thus, although we can not massage the brain directly, we can indirectly.

And I take it that this is not a matter of a few days nor even a few weeks, but a matter comparable to the grinding of a pretty big facet on a diamond—those need not begin who have not persistence to keep on awhile.

The doctor seemed careful not to say one word about the *modus operandi*. I had to invent all that for myself. I think I did fairly well at inventing and learning a modus.

The time I chose was just before I got up in the morning, while still lying in bed—wouldn't do for two-in-a-bed arrangements. It is important enough to justify some changes to one-in-a-bed arrangements.

As for me, I use it in company with other massages and motions conducted at the same time, but having different objects in view. All of them, with the desirable intervals between, take about an hour. These which I am now recommending to you take about fifteen or twenty minutes.

One difficulty that I encountered at first was that the arms, having to work in an unnatural position, and higher than the heart, got bloodless and awfully tired too soon. That gradually improved until at present I seldom think of it. I used to make haste to straighten arms down aside, and let the blood flow into them again, while the rocking of my head was in progress; for forcible rocking of the head from side to side is one resource that I think very highly of.

But my experience with rocking seems to give a hint that it may be dangerous for some persons. My eyes would get suffused with blood by the bursting of little vessels. After the first few weeks there was no more of that—nature evidently strengthened her works to match her mauling.

This rocking exercise can't very well be done standing up—and that's the main objection to having the whole performance somewhere time or place. And if you *should* happen to *take* on this I will gladly tell you more about it.

Toledo, O., Dec. 6.

E. E. HASTY.

I don't know how many times I have read the above letter over and over, and every time I read it it takes a mighty hold on me. By all means tell us more about it, friend Hasty. I think it must be about three years ago when I first began to feel I was "going to pieces" in regard to memory. There were certain things I could remember and other things I could *not* remember. For instance, my great and grievous trouble was (and to a great extent is even yet) to remember to put my letters in the mail-box when I went after my mail every day. Our postoffice is about a mile away; and every evening when I take up my eggs I go to the office; and as it is troublesome and untidy to tear open letters that have been once sealed, I do not seal any of my letters until I have looked over my mail to see that there is not a postscript to be added to one or more of them. Now, the trouble comes in here; even when young, and through all my life, whenever I give my whole undivided attention to any important matter I become more or less oblivious to all that is going on around me. This is especially true when I have some hard problem to solve; and I often say, "Just let me have this thing all by myself and I will make it come, you see if I don't." In taking charge of a great business, as I did for so many years, there were often times when I *could not* be let alone. A train was due, or a gang of men were idle until I could make a decision. Well, I discovered long ago that this pulling me off by force, as it were, from one thing to another, was exceedingly wearing on the nerves; and it is not at all strange that I finally broke down and had to call the boys home from college.

Now let us get back to the postoffice. When I began to open the letters of most importance, and give my mind wholly to the contents, I forgot every thing else; and if there was nothing to be added to any of the letters in my pocket I forgot all about them, and did this thing *over and over again*. I "turned over a new leaf," made a mighty resolution that I would never be guilty of such a silly trick again, and did all right for perhaps a couple of weeks, and then I was back at the old habit again. I think I had better confess to you that I worried and prayed over this thing (yes, *prayed*) until the sight of the postoffice almost threw me into a nervous chill, and then I went and did that *very same thing*, in spite of the "nervous chill." Once when I forgot some letters that were very important I went straight back to the office; and, although I was mad every foot of the way, I came home with the letters *still* in my pocket. There were a few other errands besides the letters, it is true; and by some queer feature of the matter I seemed capable of remembering every thing except to post the

letters I had taken so much pains to write. I seemed to be like the little girl who came in crying because she could not count the chickens. She said she counted them all but one, and that one ran about so "everlastingly" she could not count it. Mrs. Root laughed about it and said it was because I still had too much care and worry, and suggested I should stop trying to raise so many chickens, etc.; but I told her I should die sure if I was not kept busy at *something*.

After praying over the matter as I have told you, I soon began to see that this trouble was worse when I did not feel real well, especially when my digestion was bad; and when I dropped my suppers, as I have told you about at length, there was at once a very marked improvement. After I took up a daily sponge bath, as I have also explained at length, there was another very great improvement; and as I took this sponge bath I have practiced massaging, something as friend Hasty refers to, as nearly as I can make out.

I tried many expedients to overcome the trouble. For instance, I kept all my letters in my hand when I went into the office; but I was compelled to lay them on the desk when I opened my mail, and then I, *like an idiot*, went off and left them all on the desk, which was worse than leaving them in my pocket. Of course I could have carried my letters in my hand and mailed them before taking my mail out of the box; but I did not once propose giving way a single iota to this strange infirmity, for where would it end?

It has doubtless occurred to more than one of you that my account of battling with this infirmity sounds strangely like battling with real sin; and, to come right down to the truth of it, forgetting *is* a sin, and at times a most grievous sin. Witness the loss of life and limb that has resulted several times lately where a motorman has forgotten himself and run on some other car's time. Let me digress a little:

Years ago, before I became a Christian, I got to thinking one Sunday afternoon about a certain thing in my life that needed correction, and really *had* to be corrected. I remember vividly going out alone into the woods and sitting down on a log and thinking it over. After some serious meditation I arose, and, raising my right hand, took a solemn oath before God that *henceforth* and *for ever* I would be *free* from this thing that threatened my peace, my happiness, and my life. I have just been reminded of this incident by what our good pastor and others have been saying about "New Year's resolutions," as this is only the third day of January as I write. Do you remember when Peter said, "Though I should die with thee, I will not deny thee"? The Master said to him that Satan should sift him as wheat, and Satan "sifted" my poor proud self *within a couple of hours* after. I held up my head in a manly way in the woods, and declared *I* would be master henceforth,

and not a foolish silly inclination, and I walked home from the woods with my head up, feeling manly and glad to think I was *through* with the conflict with evil. Do you wish to know how it turned out? Before the sun went down I was deeper in the "slough of despond" than I had ever been before. I was so completely whipped out and discouraged that for a time I gave up. I was like the intemperate man who said to me some years after, "Mr. Root, this is a horse I can not manage. When he gets me on his back I must go where he carries me. I really can *not* help myself." That "horse" did finally (as I told him it would) carry him to a drunkard's grave.

Now, dear friends, *here* is the great point of my long story. After I had said several times, "Now I know I will never do this ridiculous thing again as long as I stay in Florida," and then found myself back in my old tracks *before the day was gone*, I began to think of that scene in the woods of long ago, and to reflect on *how* deliverance came. When poor Peter stopped telling what *he* could or would do in his own strength, and said, as he did when sinking in the water, "Lord, save or I perish," *then* he became a great apostle of righteousness.

When I was forced to acknowledge that A. I. Root, with all his grit and vehemence, was only a frail willow twig in the hands of Satan, and when, instead of calling on God to witness what *I* would do, I sat at the feet of the dear Savior and depended on *his* strength and not my own, I got out of my troubles; and, more than that, helped others out.

Terry, Fletcher, Battle Creek, and a host of others are doing grand things toward helping us to care for, in a sensible way, these bodies of ours; but with all these helps let us remember Him who said, "Him who cometh to me I will in no wise cast out;" and I am sure this promise includes the forgetfulness of old people, even in such a matter as failing to mail the letters that are already in their pocket, ready to go.

I do not believe that out in the woods (or anywhere else for that matter, all by yourself) is the best place or condition for a New Year's resolution, nor for a resolution of any sort, to break away from sinful habits. Make your pledge in the presence of your good wife or sister, or, better still—yes, far better, in your weekly prayer-meeting, and let all your brothers and sisters in the church hear it, and ask them to pray for you. This is the common-sense way, and the one the Holy Scripture endorses.

At the close of a business letter my good friend Terry takes in a similar thought. Here is what he says:

Dear Mr. Root:—Glad you are well. Really it wouldn't look very well for you to be any other way. And I am glad, also, that you have a typewriter. It is well to keep up with the times—keep growing if we want to stay here. When we stop we stagnate and begin to die. God smiles on a progressive fighter—that is, if he lives in accord with the Creator's laws.

Hudson, O., Dec. 17.

TERRY.

Do you see the connection? It certainly

would not look well for either Terry or myself to be caught *sick* after all we have said about getting well and keeping well. In the same way it would look very bad for one who had confessed his sin before his friends in the church to go back and be found guilty of the same thing once more.

Let us remember Him who is not only able to "forgive all our iniquities," but who, as well, "healeth all our diseases, and who also knoweth our frame. He remembereth that we are but dust." Let us also remember that beautiful little text that has for generations been learned by heart and repeated by thousands of children, "Wherefore, let him thinketh he standeth" in his own strength, "take heed lest he fall;" for the only strength that can carry us safely through all life's battles as well as through the failing faculties of old age, and not only through life but through death, is the strength that comes through Christ Jesus, the Savior and Redeemer of all mankind throughout the whole wide world.*

In my talk above there is one thing I omitted to touch on. We should use every means to relieve the memory of unnecessary burdens. To illustrate: For years past I have been sure to leave my umbrella somewhere, whenever I started out with one. Finally I headed off the trouble by always placing my cap on my umbrella as I stood it in a corner; and when I went for my cap I was always reminded of the umbrella. In this way we can make sure in similar cases of avoiding causing useless steps and delays, not only for ourselves but for our friends and neighbors also. With my old Olds mobile there were *seven* different things to be done in starting, and almost as many to be remembered in stopping. Well, for a time it seemed that I never could remember all of them; and the consequence was that I left the oil or gasoline (or both of them) turned on when I stopped, and then there was not only trouble in starting next time but a waste of fuel, and unsightly grease spots all the time, more or less, on the cement floor of the auto-house, making it almost impossible to keep things looking tidy, even if we tried never so hard. Well, I finally learned by sad experience to get over forgetting these trifling matters most of the time. I almost forgot to mention that leaving the *switch* turned on when I stopped might result in a total loss of the expensive batteries. Now listen while I try to tell you how the great inventors of the day have helped old people and every one else right along in this line. When you start the new machine, if you start on the magneto there is no switch to be turned off, for there is no electric current for ignition until the machinery is running, and, as a consequence, when the machinery stops the electric current is already

stopped. In a like manner the oil is fed to the bearings by a little pump that pumps oil only when "the wheels go round." When the wheels stop, the oiling stops. In a like manner the gasoline is fed only when gasoline is needed to run the engine. In short, if you find the chickens over the fence in the garden when you get home from church you can hop out of your auto and chase the chickens without waiting to do any thing, if you choose. Of course, you swing around the two little levers when you slow up; but this is all done with one finger; and if you are going to stop but a little while you may leave the engine running very slowly and very quietly, so as to avoid the laborious cranking when you want to start up again. Speaking about the "cranking," yes, it *does* take, at times, quite a little effort unless you are pretty strong in the arms; but if it isn't too severe on you I think it is an excellent exercise to develop the muscles and chest. Yes, I know there are devices on the market for "automatic starting," but so far as I can learn they are pretty expensive as yet.

Now to get back to my subject. When I started out writing this talk on my new typewriter I was very much pleased to find I could write almost a page without making a single mistake; yes, I succeeded even in using a capital letter when I came to the pronoun "I," and nothing vexes me so much as to find, when reviewing my copy before sending it to press, to find I have backslid into my old habit of using a little "i" when speaking of myself. Do you wonder why I mention so trivial a matter? Well, there is a moral and a lesson to it. It is this: I find I can stand the confinement of writing only about so long without getting so tired that it takes a very unusual effort to avoid making mistakes. The moral is this: If you are past or nearing the seventies, keep busy; but don't try to work too long at one thing until you are too weary to use your memory and other God-given faculties to the best advantage. Drop your typewriter and go and see how the hired man is getting on in making a new yard for that flock of downy beauties that should come out of the incubator about to-morrow. That is just what I am going to do now; so, "good by," as they say over the telephone.

"THE TRUTH ABOUT SWEET CLOVER" IN FLORIDA; ALSO SOMETHING ABOUT ALFALFA IN THAT STATE.

After having talked with many people, and getting various kinds of reports in regard to alfalfa and other clovers in Florida, it finally occurred to me that the agricultural experiment station at Gainesville would most likely be able to give me the "truth" in regard to the matter, and at the same time an unbiased statement; and since there have been so many inquiries in regard to the matter I feel ashamed of myself to think I did not go to headquarters

*None but Christ Jesus can unlock the clutches of Satan when he once gets a poor sinner well in his terrible grip. "For there is none other name under heaven given among men, whereby we must be saved."—Acts 4:12.

for information long ago. Now I am able to give you something reliable and definite in regard to both sweet clover and alfalfa; from my good friend Professor Rolfs.

UNIVERSITY OF FLORIDA,
AGRICULTURAL EXPERIMENT STATION,
Gainesville, Sept. 9, 1910.

Mr. A. I. Root:—Sweet clover grows almost spontaneously all along the rocky portion of the east coast of Florida; also to some extent in the interior; but for the most part the interior is not supplied with a sufficient amount of lime to make the best growth of sweet clover. It will do pretty well if the soil does not get too dry, and is at the same time well supplied with carbonate of lime. There are quite a number of other legumes belonging to the clover class that do well under some conditions.

Alfalfa has been tried a great many thousand times in this State. The general experience is the same as that you had. It will grow well until the summer rains come on, then it can not compete with the weeds and native grasses. If we have a rainy summer it is very likely to be drowned out, or at least so badly injured that all sorts of root-inhabiting fungi attack and destroy it. We inclose you a copy of our press bulletin on alfalfa. The conditions are about the same at the present time as they were when the bulletin was written. I have a patch of some fifteen or twenty varieties of alfalfa that were planted out two years ago. While the plants live and produce considerable forage, the amount that they give us does not compare with what cow-peas, beggarweed, or velvet beans give us. Please accept my thanks for your book on sweet clover.

P. H. ROLFS, Director.

Here is the extract referred to:

Press Bulletin No. 66, Sept. 30, 1907.

FLORIDA AGRICULTURAL EXPERIMENT STATION.
(Alfalfa.)

BY P. H. ROLFS.

The fact that Florida needs a winter forage-plant is so well known to every one who has attempted to keep live stock here that no arguments in this line need be produced. We have an abundance of summer and fall forage, which stock may secure either by grazing or by having it fed to them. The one thing we lack, however, is a green forage or pasture crop for the winter. Rye and oats have been used for many years, but are expensive and more or less uncertain.

KIND OF LAND TO USE.

Alfalfa should be planted on land that is rated at least as first-class farming land. The field should be prepared as thoroughly as would be the case for either grain or corn. The land should have perfect drainage, but should not be of a loose sandy character. Alfalfa planted on sandy land underlaid with clay has been most nearly successful.

Still an Experiment.—Hundreds of attempts have been made to secure a good stand of alfalfa, and to make the field productive. In a number of cases the experiment has been so nearly successful that people have declared that they had reached the successful point. Up to the present, however, no field of alfalfa has succeeded in growing through the second winter and producing a crop of hay during the ensuing year. Numerous plots have been sown, and have produced an abundant crop of fine alfalfa hay; but these plots failed completely, either during the late fall or early winter; so that we can say that the experiment has reached the point where it has been almost successful, but yet not quite. Good fields of alfalfa have been produced near Dade City, Leesburg, Monticello, and DeFuniak. Probably the most nearly successful field was that grown by Mr. C. K. McQuarrie at DeFuniak. From this field Mr. McQuarrie secured alfalfa hay at the rate of several tons to the acre.

SOWING ALFALFA.

Mr. Coburn, in his book on alfalfa, states that quantities all the way from six to sixty pounds per acre are recommended. He calculates that, if fifteen pounds be used, and all the seed germinate, it would give us forty-four plants to the square foot. This, of course, would be altogether too many plants. As we would not expect every seed to make a plant, it will probably be best to sow the seed fairly thickly.

How to Sow.—The most usual way of sowing alfalfa is to sow it broadcast. For experimental work it would probably be better to sow it in drills, espe-

cially if one were sowing only a fraction of an acre. With drills it is a great deal easier to keep down weeds that might come up to choke out the seedlings. Ordinarily there is very little trouble from this source, however, and it will be found that broadcast sowing does fairly well.

Time to Sow.—The best time to sow alfalfa in Florida is during the fall of the year. Just what time in the fall will depend upon climatic conditions. If the soil is moist, and the heavy rains have ceased to fall, any time during October and the early part of November will be proper. This will give the plants sufficient time to make a considerable root growth before the winter arrives. During the winter the young plants will make only a small top growth, but the roots will penetrate more deeply into the soil and produce a good system before spring. When the early spring rains begin it will be necessary to remove any large weeds or grass coming up in the field, either by mowing them off or by having them hoed out.

Under favorable conditions two or three tons of hay may be made from an acre. This hay, when well cured, is worth at least \$20.00 a ton. Considering the value of alfalfa hay, it will pay to sow fresh seed every year, even if the plants should all die out the second fall, as has been the case.

REPORTS OF SUCCESS.

Repeated reports of complete success with alfalfa have been seen in the various papers of the State. Officers of the experiment station have made it a point to investigate all of these carefully. In some cases it was found that these reports were circulated before the alfalfa-field was one year old. Success up to this point is no unusual occurrence.

Other reports of success have been investigated, and were found to be based on erroneous identification. Frequently people have mistaken sweet clover (*Melilotus*) for alfalfa. This crop, of course, can be grown, and the plant occurs in many portions of the State as a weed. It is, however, very much inferior to alfalfa as a forage-plant and also as a soil-renovator.

SOIL INOCULATIONS.

For a time it was thought that inoculating the soil with the nitrogen-fixing organisms would overcome the difficulty of alfalfa failures. A great many experiments have been made with the commercial cultures, with cultures from the Department of Agriculture, and with soil taken from alfalfa-fields. Most of the experiments with cultures have proven complete failures; and where they have been successful they have given results inferior to those obtained by the use of soil from alfalfa-fields.

A KIND WORD FROM ONE WHO HAS READ GLEANINGS FOR NEARLY 40 YEARS.

Dear old Friend Root:—We have never met, but I have been intimate with your true self for years; for as a man thinketh, so is he; and if you don't say what you think, I know of no one who does.

I write for a double purpose—first, to thank you for the constant stream of wisdom and goodness that has flowed from your heart through your pen ever since I first read the pamphlet GLEANINGS down in Mississippi, somewhere in the late '70's. So here is a hope that you may continue to sow the good seed for many coming years.

SULPHUR FOR CHICKENS, ETC.

Second. I wish to furnish the information you seek about the power of sulphur, when taken internally, to permeate the tissues of the body. It can, and will, and does. Every doctor of experience will agree that, if a patient takes liberal doses of sulphur for two or three days, all the silver money in his pockets or about his person will be blackened by the fumes transuded through the skin, and you can smell brimstone whenever he is near.

A level teaspoonful of sulphur taken every morning for a few days acts as a harmless laxative.

I have been much interested in the discussion as to why bees are so terrified by smoke, and have listened in vain for some one to suggest that, because of the peculiar nature of their breathing apparatus, the little air-holes, being so very small, is it not possible that smoke causes in them a sense of impending suffocation, so that all the fight is choked out of them?

This is merely a query, not a theory.

Mobile, Ala.

H. A. MOODY.